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ANNUAL REPORT 2016

年 度 报 告

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State Key Laboratory of Estuarine and Coastal Research (East China Normal University)

2016年度报告
ANNUAL REPORT

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Prof. Dr. GAO Shu, East China Normal University

CAS – Chinese Academy of Sciences
CAE – Chinese Academy of Engineering
SOA – State Oceanic Administration of China
MOC – Ministry of Transport of the People's Republic of China

SKLEC Board of Directors

Director: Prof. Dr. GAO Shu
Deputy Directors: Prof. Dr. WU Hui, Prof. Dr. ZHANG Weiguo, Mr. ZHAO Changqing

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实验室简介
SKLEC Introduction

河口海岸学国家重点实验室缘自1957年由教育部批复建立的华东师范大学河口研究室，依托华东师范大学，于1989年由原国家计委批准筹建，1995年12月通过国家验收并正式向国内外开放。

经过二十多年的建设，实验室已拥有一支结构合理、多学科交叉、专业互补、老中青结合的研究队伍；配备了先进的野外勘测及室内测试与分析仪器。实验室现有固定人员60人，其中研究人员51人（教授30人，副教授14人，讲师7人；具有博士学位的50人），技术人员7人，管理人员2人。秉承“开放、流动、联合、竞争”的运行机制，实验室瞄准国际学科前沿，围绕国家重大需求，在河口海岸学科前沿领域深入进行应用基础性研究，已成为代表我国河口海岸研究水平的科研基地与高层次人才的培养基地。

The State Key Laboratory of Estuarine and Coastal Research (SKLEC) was established in 1957 with a core of estuarine and coastal research in East China Normal University (ECNU). It was set up by the former State Planning Commission of China in 1989, and went into operation in December 1995. It is now co-sponsored by the Ministry of Science and Technology of China (MOST) and ECNU.

Since 1989, the laboratory has formed a number of multidisciplinary research teams, equipped with advanced instruments both for fieldwork and laboratory analysis. There are 60 fulltime faculties and staff in the laboratory, which include 51 research faculties: 30 professors, 14 associate professors, and 7 lecturers (50 with Ph.D. degree), 7 technicians and 2 administrative staff.

SKLEC carries out a large amount of theoretical and applied research projects to serve the demands of national development, social sustainability, and frontline science. Guided by the philosophy of “Openness, Exchange, Cooperation and Competition”, it has become a high level research and training base for estuarine and coastal studies in China.

大事记
Headlines

运行管理
Operations and Managements

2016年5月，教育部科技司发文，聘任高抒教授担任河口海岸学国家重点实验室主任、陈大可院士担任实验室学术委员会主任，任期五年（教育部发文教技司[2016]202号）。

In May, 2016, the Science and Technology Division of the Ministry of Education appointed Prof. GAO Shu as the director of State Key Laboratory of Estuarine and Coastal Research. Meanwhile, Academician Prof. CHEN Dake was appointed as the director of the Academic Committee of SKLEC. The term of office is five years.

2016年5月，河口海岸学国家重点实验室换届工作圆满完成，确定了河口海岸学国家重点实验室的新一届领导班子，聘任高抒为新一届重点实验室主任，聘任吴辉、张卫国为河口海岸学国家重点实验室副主任，任命赵常青为河口海岸学国家重点实验室副主任。

In May, 2016, the new managing team of State Key Laboratory of Estuarine and Coastal Research (SKLEC) came into operation successfully. Prof. GAO Shu was appointed as the director of the SKLEC, associate Prof. WU Hui and Prof. ZHANG Weiguo were appointed to be the deputy directors, and Mr. ZHAO Changqing was allocated the role of deputy director of SKLEC.

2016年11月27日，实验室第六届学术委员会第一次会议在校理科大楼召开。本次会议确定了实验室第六届学术委员会组成。实验室学术委员听取并审议了高抒主任工作报告，重点围绕实验室未来的发展进行了讨论。

On November 27th, 2016, the first meeting of the sixth SKLEC Academic Committee was held in the Like Building. The academic committee members were officially appointed in this meeting. Then the academic committee members listened to the report from director Prof. GAO Shu and had an in-depth discussion focusing on the future developments.

2016年10月16日海洋科学学院成立仪式在华东师范大学举行。海洋科学学院与河口海岸科学研究院采取“两块牌子，一套班子”的方式运行。河口海岸科学研究院院长、河口海岸学国家重点实验室主任高抒教授为海洋科学学院首任院长。

On October 16th, 2016, the establishment ceremony for the School of Marine Science (SMS) was held at ECNU. SMS and Institute of Estuarine and Coastal Research (IECR) are operated by the same team. Prof. GAO Shu, the dean of IECR, the director of SKLEC, is assigned as the first dean of SMS.

2016年1月，华东师范大学海洋塑料研究中心成立，作为非实体研究机构，挂靠河口海岸学国家重点实验室。

In January 2016, the Ocean Plastics Research Center of ECNU was established as a non-physical research institute, which is affiliated to State Key Laboratory of Estuarine and Coastal Research.

研究生培养
Student Programs

院、室首次全面采取博士研究生（含硕博连读生）“申请考核入学制”综合考核制度，目的是加大对优秀生源的吸引力度，逐步建立与国际接轨的研究生招生制度，扩大导师、院系在人才选拔中的自主权。

With the purpose of attracting more excellent students, SKLEC established a new postgraduate enrollment policy further in line with the international system. Under this policy, the tutors will have more authority to choose the preferred students.

2014届河口海岸学专业博士生裘诚和环境科学硕士生史晓东的学位论文入选2015年上海市研究生优秀成果（学位论文）。

The degree dissertations by PhD. Students QIU Cheng and master student SHI Xiaodong were awarded the Outstanding Dissertation of Shanghai Graduate Students by Shanghai Municipal.

学术交流
Academic Exchange

2016年7月，“河口海岸学战略研讨会”在实验室举行。来自河口海岸领域的30余位国内知名学者出席会议。本次会议主题为“全球气候变化和人类活动引发的河口海岸系统转换”，主要任务是围绕国家和学科需求，对比国际先进研究水平，找出阻碍学科发展的瓶颈和因素，针对未来发展的机遇和重点方向，提出发展新思路。

In July, the workshop on new directions of estuarine and coastal studies was held in SKLEC. More than 30 experts attended the meeting. Their discussions focused on estuarine and coastal system transformation caused by the global climate change and the human activities.

2016年10月，召开河口海岸学国家重点实验室第三届国际咨询会。来自美国、英国、荷兰、德国、以色列等10余所科研机构和高校的20多位专家学者，以及河口海岸学国家重点实验室的主要研究人员出席了此次会议。专家针对共同申报大型合作项目、青年科学家成长和学生联合培养等问题提出了建设性的意见和改革措施。

In October, 2016, the 3rd SKLEC International Consultation Meeting was held in ECNU. More than 20 experts from US, Britain, the Netherlands, Germany, Israel, and scholars from SKLEC attended the meeting. The experts gave suggestions on applying major cooperative projects, developments of young scientists, and jointly advising students.

国际合作
International Cooperation

2016年2月，为扩大两校在科研、教学等领域的交流，与美国路易斯安那州立大学签署两校合作协议。

In February, 2016, East China Normal University (ECNU) signed the MOU with Louisiana State University (LSU) to broaden collaborative work in scientific research and student training.

2016年3月，与荷兰代尔夫特理工大学正式签署联合授予博士学位合作协议。

In March, 2016, ECNU signed the MOU with Delft University of Technology in jointly awarded doctoral degree.

2016年9月，与加拿大科学出版社签署合作出版协议，合办学术期刊“Anthropocene Coasts”。首期刊物计划于2017年出刊，按照目前国际刊物的发展趋势，采取开放获取方式，以电子期刊形式发行。

In September, 2016, ECNU signed the MOU with Canadian Science Publishing (CSP) in launching a new open access international journal: Anthropocene Coasts. The first issue is scheduled to be published in 2017. It will be an open-access journal in electronic version, following the trend of the current international publication development. It will provide a high-quality publication forum for a global population of scientists.

2016年11月，长江与尼罗河三角洲研究中心成立，埃及卡夫拉谢赫大学与我室签署合作协议，旨在进一步推动研究的广度与深度，培养人才。

In November, 2016, a ceremony was held for the Foundation of Comparative Studies between the Yangtze and the Nile Delta. The MOU was signed between ECNU and Kafrelsheihk University. This founded delta center is aiming at not only scientific research, but also new talent cultivation.

科研项目
Research projects

由我室李道季教授作为首席科学家牵头申报的国家重点研发计划项目“海洋微塑料监测和生态环境效应评估技术研究”获批立项，获批经费1600万元。11月23日，项目启动会在北京召开。

The National Key Research and Development Program of the Ministry of Science and Technology “Research of Techniques on Marine Microplastic (MP) Monitoring and Its Eco-environmental Effects Evaluation” hosted by Prof. LI Daoji was approved. The fund is 16 million RMB in total. The initiation meeting of this project was held on 23 Nov., 2016 in Beijing.

由我室陈中原教授领衔的“早-中全新世长江与尼罗河三角洲环境演变异同及早期农业文明对比研究”项目获国家自然科学基金重点国际（地区）合作研究项目资助。该项目由华东师范大学主持，埃及Kafrelsheihk和法国Axis-Marseille大学参加并共同承担。

The NSFC Key Program of International Cooperation and Exchanges “A Comparative Study Between the Yangtze and Nile Delta: the Similarity and Discrepancy of the Early-Middle Holocene Environmental Evolution and Early Agricultural Civilization” was approved. It was hosted by Prof. CHEN Zhongyuan. The oversea partners are the University of Kafrelsheihk (Egypt) and the University of Axis-Marseille (France)

由我室沈芳教授主持的“水环境的高光谱及多源高分辨率光学遥感研究”获国家重点研发计划重点专项立项资助，该项目合作方为比利时皇家科学研究院。

The project “Hyperspectral and Multi-mission High Resolution Optical Remote Sensing of Aquatic Environments”, hosted by Prof. SHEN Fang, was approved by the Ministry of Science and Technology. The oversea partner is the Royal Belgian Institute for Natural Sciences.

人物
People

2016年陈吉余院士被国家海洋局授予“终身奉献海洋”奖章。

Prof. CHEN Jiyu was awarded a Lifetime Achievement Award from the State Oceanic Administration.

刘权兴教授入选第十二批国家“千人计划”青年项目人才计划。

Prof. LIU Quanxing was selected into the Recruitment Program for Young Professionals (also known as the Thousand Youth Talents Program) of China.

杨世伦教授获批享受国务院特殊津贴专家。

Prof. YANG Shilun was confirmed as the expert of Special Government Allowances of the State Council.

刘东艳受聘为华东师范大学紫江优秀青年学者。

Dr. LIU Dongyan was chosen as the “Outstanding Zi Jiang Young Scholar” of East China Normal University.

杨世伦、李道季教授晋升为华东师范大学二级教授。

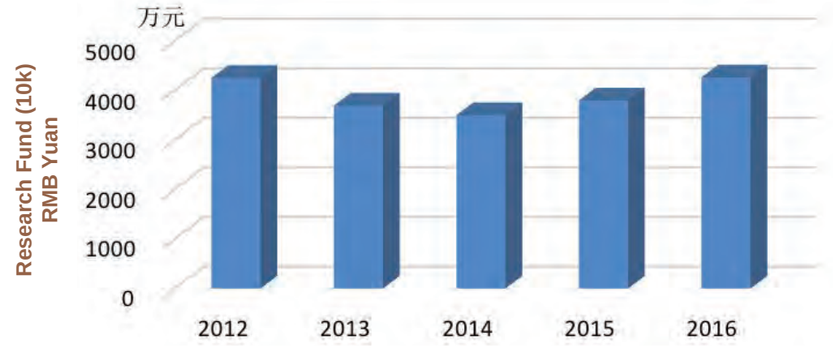
Prof. YANG Shilun and LI Daoji were promoted to second-grade professors of East China Normal University.

科研课题与进展
Research Programs and Highlights

科研课题
Research Programs

2016年度，实验室新增项目30余项，新增合同经费4416万元。其中，国家、省部级项目新增20余项，合同经费3975万元。2016年度，实验室合计承担课题100余项，实到经费3859万元，其中国家和省部级课题80余项，实到经费3374万元。此外，实验室还获得科技部国家重点实验室专项经费685万元，其中285万元用于自主研究课题的部署，400万元用于实验室管理运行和开放课题。

30 new projects were granted in 2016 with total funding of 44.16 million RMB. Among them, more than 20 projects were awarded from national or provincial funding agencies, which total 39.75 million RMB. In 2016, 103 research projects were carried out with total funding of 38.59 million RMB. Among them, more than 80 projects were granted by national, provincial and ministerial funding agencies, which totaled 33.74 million RMB. In addition, SKLEC received special funding from the Ministry of Science and Technology (MOST) of China, among which 4 million RMB was specifically aimed at scientific research, 2.85 million RMB for administration and operation of SKLEC.



2012-2016年实到经费
Competitive Research Fund Received in 2012-2016

科技部国家重点研发计划“海洋环境安全保障”重点专项：海洋微塑料监测和生态环境效应评估技术研究（2016YFC1402200）

The National Key Research and Development Program of the Ministry of Science and Technology for the Safety and Security of Marine Environment: Research of Techniques on Marine Microplastic (MP) Monitoring and Its Eco-environmental Effects Evaluation (Grant No. 2016YFC1402200)

项目依托华东师范大学河口海岸学国家重点实验室，联合国家海洋环境监测中心、中国科学院烟台海岸带研究所、南京大学、中国环境科学研究院等国内优势单位共同实施。通过对海洋微塑料监测和生态环境影响评估技术研究，揭示我国典型河口、近海微塑料的来源、通量及时空变化趋势，揭示微塑料污染对海洋生态系统的影响，建立我国海洋微塑料分析标准和监测方法，研发微塑料海洋生态风险评估和污染源头管控等关键技术，提升我国在海洋微塑料污染监测、生态风险评估和管控方面的综合能力。

The project is hosted by East China Normal University, and in collaboration with the National Marine Environmental Monitoring Center (State Oceanic Administration), Yantai Institute of Coastal Zone Research (Chinese Academy of Sciences), Nanjing University, and Chinese Research Academy of Environmental Sciences.

Based on the investigation of techniques on marine MP monitoring and its eco-environmental effects assessment, this project aims at discovering the sources, flux and tempo-spatial trend of MP contamination in the typical estuaries and coastal sea of China, assessing potential impacts of MP on marine ecosystems, establishing the national standards for MP analysis and monitoring, developing techniques of MP risk assessment and pollutant source control, and finally strengthening the capacity of the monitoring, ecological risk evaluation, pollutant control and management of MP in China Sea.

科技部国家重点研发计划政府间国际科技创新合作重点专项：水环境的高光普及多源高分辨率光学遥感研究（2016YFE0103200）

The National Key Research and Development Program of the Ministry of Science and Technology: Hyperspectral and Multi-mission High Resolution Optical Remote Sensing of Aquatic Environments (Grant No. 2016YFE0103200)

本项目中方承担单位为华东师范大学，外方是比利时皇家自然科学院。合作研究目标：共同研制新的遥感反演算法，定量反演全球河口/海岸/内陆浑浊水体浮游植物种类和特征色素浓度、非生物颗粒物浓度、类型和粒径等水环境参数；充分发掘国内/外先进的高光谱/高空间分辨率多源卫星观测技术对水环境监测和定量评估的应用潜力；在全球典型浑浊水域开展算法及产品验证。为未来卫星传感器的设计提供科学依据，为中外卫星观测水环境提供应用示范。中外研究团队通过项目内容分工合作，拟实现技术集成和创新、方法和区域优势上互补双赢，使研究与技术水平达到世界先进水平，并通过应用示范，提升我国对地观测技术的应用能力、信息服务和决策支持水平，为我国防灾减灾、水质环境、生态安全、港口工程、气候变化等重要领域提供监测与评估信息及决策支撑。

The safety of the aquatic environment has become a common global concern, as well as the fact that remote sensing by satellite is indeed the best way to monitor and evaluate the health of ecosystem in a long term. The Chinese partner is State Key Laboratory of Estuarine and Coastal Research of East China Normal University, and the foreign partner is the Royal Belgian Institute for Natural Sciences. The objectives of this cooperative research are: 1) to jointly develop new remotely sensed inversion algorithm, for the purposes of quantitative inversions about phytoplankton species, diagnostic pigment concentration and non-biological particle concentration type size in estuarine coastal inland turbid waters globally; 2) to fully explore the potential of applications concerning domestic foreign advanced hyperspectral high spatial resolution multi-mission satellite observation in the aspect of the water environmental monitor and quantitative assessment; 3) to develop algorithms and validate production in turbid waters throughout the world. It will provide a scientific basis for the design of satellite sensors in the future, and an application demonstration of monitoring the aquatic environment for both Chinese and foreign satellites. Through collaborative efforts, the research teams plan to achieve the integration and innovation of technology and complementary win-win development based on methodological and regional advantages, aiming to reach the world-class advanced level of research and technology. Moreover, through the application demonstration, the research teams will improve the level of application ability, information service and decision support of the technology for earth observation in our country. Therefore, monitoring, evaluating information and decision support can be provided in many important fields, such as, disaster prevention and mitigation, aquatic quality environment, ecological security, port engineering, climate change and so on.

部分新增项目
Selected New Projects

国家重点研发计划项目 The National Key Research and Development Program of MOST	
海洋微塑料监测和生态环境效应评估技术研究(2016YFC1402200) Research of techniques on marine microplastic (MP) monitoring and its eco-environmental effects evaluation (2016.09-2020.12)	李道季 LI Daoji
河口生态系统对大型水库调控的响应及应对策略(2016YFA0600904) Responses of estuarine ecosystems to large reservoir regulation and associated coping stragegies (2016.07-2021.06)	侯立军 HOU Lijun
水环境的高光普及多源高分辨率光学遥感研究(2016YFE0103200) Hyperspectral and multi-mission high resolution optical remote sensing of aquatic environments (2016.12-2019.09)	沈芳 SHEN Fang
国家自然科学基金项目-应急管理项目 NSFC Special Fund	
长江口科学考察实验研究(41549903) Scientific investigation of the Yangtze (Changjiang) Estuary (2016.01-2016.12)	高抒 GAO Shu
河口海岸学战略研讨(41642003) Workshop series on the new directions of estuarine and coastal studies (2016.04-2016.12)	高抒 GAO Shu
国家自然科学基金面上项目 NSFC General Project	
滨海盐沼湿地多组分碳过程与净收支的复杂水文调控机制(41571083) Roles of complex hydrological conditions in regulating multi-component carbon processes and net budget in coastal salt marsh (2016.01-2019.12)	葛振鸣 GE Zhenming
我国沿海紫贻贝中微塑料的污染特征及环境指示作用(41571467) Microplatic in musssels from the coastal waters of China and its indication for the environments (2016.01-2019.12)	施华宏 SHI Huahong
宁波-姚江平原新石器遗址记录的全新世中期水涝灾害及古人类响应与适应对策(41576042) Lessons from the past: Catastrophic flooding, societal vulnerability and cultural adaption during the Neolithic on the Ningbo-Yaojiang Plain, eastern China (2016.01-2019.12)	王张华 WANG Zhanghua
钦州湾海底地下水的生源要素输送通量研究(41576083) Fluxes of biogenic elements via submarine groundwater discharge in Qinzhou Bay (2016.01-2019.12)	杜金洲 DU Jinzhou
长江河口边滩冲淤机制及其泥沙捕集效应研究(41576087) The erosion and accretion mechanism and sediment trapped effects of the frontier tidal flat in the Changjiang estuary (2016.01-2019.12)	戴志军 DAI Zhijun
长江河口和苏北海域之间的水体交换机制研究(41576088) Water mass exchange between Changjiang Estuary and Subei Coastal Water (2016.01-2019.12)	吴辉 WU Hui
风暴过程中三角洲淤泥质海岸泥沙运动探讨(41576092) Sediment transport processes in muddy delta coasts during storm events: A case study (2016.01-2019.12)	杨世伦 YANG Shilun
东海内陆架泥质区沉积物磁性特征的早期成岩改造及其影响因素(41576094) Diagenetic lateration of magnetic minerals in inner shelf deposits of the East China Sea and its controlling factors (2016.01-2019.12)	张卫国 ZHANG Weiguo

国家自然科学基金青年科学基金项目 NSFC Young Scientist Fund	
河口区径流潮汐相互作用及其机制研究(41506105) River-tide interactions and the governing mechanisms (2016.01-2018.12)	郭磊城 GUO Leicheng
聚苯乙烯塑料粒子对河蚬的毒动力过程与毒理学效应(21507031) The toxicological dynamic process and effects of polystyrene microplastic on Asia clam (Corbicula fulminea) (2016.01-2018.12)	Prabhu Kolandhasamy
省部级项目 Project Funded by Provincial and Ministerial Commission	
长江口典型湿地植物对重金属的修复潜力及抗性适应机制研究(16ZR1410300) 上海市自然科学基金青年项目 The adaptation mechanisms of typical wetland plant in the Yangtze River Estuary to heavy metals and it's heavy metal remediation potential (Young Scientist Project, Shanghai Natural Science Fundation) (2016.07-2019.06)	闫中正 YAN Zhongzheng
长江口湿地底栖纤毛虫原生动物多样性及群落结构特征(2016T90352) 中国博士后基金会 Biodiversity of benthic ciliated protozoa in Yangtze estuary wetlands and their response to environmental factors (China Postdoctoral Science Foundation) (2016.07-2017.12)	许媛 XU Yuan

科技部实验室专项基金
MOST Special Fund

2016年，科技部实验室专项共资助人才队伍自主课题5项。
Laboratory special fund, supported by the Ministry of Science and Technology (MOST) of China, granted to six projects including key projects and talent funds.

专项基金资助一览表
List of Receipients of Special Fund

项目名称 Project	负责人 Investigator
Vulnerabilities and Opportunities of the Coastal Ocean (VOCO)	Richard Bellerby
河口区中抗生素的分布及污染特征 Distribution and pollution characteristics of antibiotics in the estuary areas	周俊良 ZHOU Junliang
长江口季节性低氧水形成及其分布的物理机制 Mechanisms controlling seasonal hypoxia formation and spatiotemporal distribution over East China Sea	张文霞 ZHANG Wenxia
基于陆面过程模型的长江口盐沼湿地水、热、碳通量模拟研究 simulation of water, heat and carbon fluxes in salt marsh wetlands of the Yangtze river estuary based on land-surface models	黄颖 HUANG Ying
长江口南汇边滩冲淤转换的水体悬沙浓度阈值诊断 Research on estuarine erosion/deposition mechanism and early warning	梅雪菲 MEI Xuefei

科研进展
Research Programs

2016年，实验室在在河口海岸动力和沉积方面，通过现场观测、理论分析和模拟等手段，揭示了多重分潮和变化径流条件共同作用下河口大尺度地貌演变的规律，年代际尺度上上游来水来沙变化和河口重大工程对长江河口地貌演变的影响，人类活动对河口泥沙源汇转换的影响，年代际尺度下无人沙洲、长江口北支河道以及整个长江河口的地形演变，河口潮汐不对称对河口水沙输送的影响机制，以及波浪和植被对再悬浮泥沙的特性的影响。采用同位素示踪、测年、磁学、释光等技术手段，对河流入海泥沙的性质、输送、以及口外海域浮动泥的分布及动力过程进行了深入研究。

In 2016, SKLEC conducted systematic observational, theoretical, and modeling studies on the hydrodynamics and morphological processes in the estuarine and coastal areas. We made advancements in the large-scale estuarine morphological evolution under the multiple tide constituents and river discharge, estuarine evolution under decennial variations of water and sediment discharges, source-sink shift of the sediments in estuary under anthropogenic activities, decadal morphological evolution of the uninhibited island, North Branch in the Changjiang River estuary and the entire Changjiang River Estuary, the mechanism of tidal asymmetric sediment transportation, as well as wave and vegetation effects on flow and suspended sediment characteristics. We also employed isotopic, magnetic, and optical tracing/dating methods, revealing the sediments property, transportation or mobile mud formation in and outside the estuary of multiple river systems.

河口海岸环境和生态方面，在国内率先开展了海洋微塑料污染的研究，系统探讨了中国近海和内陆湖泊等水体和生物体（如贻贝和鸟类）微塑料含量，并发展了半自动快速识别方法。对河口氮循环进行了进一步的深入研究，量化了人类活动导致的氮输入在总量中的贡献，揭示潮间带盐沼潮泵作用对异化性硝酸盐还原的作用机制，甲砜霉素对河口海岸泥沙中的硝酸盐还原作用和二氧化氮排放的影响。在生态方面，探讨了海平面快速上升对中国沿海潮间带盐沼分布的影响， 生物的自组织运动行为，和受地下水影响下的沉积物微生物的分布规律。

SKLEC scientists also made crucial progress in the environmental and ecological sciences in estuaries. We conducted pioneering studies on the microplastic pollution in coastal and lake waters, systematically revealed the microplastic in the mussels and birds, and developed a semi-automatic recognition method. We quantified the net anthropogenic nitrogen inputs (NANI) into the Yangtze River basin, found tidal pumping can facilitate the dissimilatory nitrate reduction in intertidal marshes, and discovered the *nirS*-Encoding denitrifier community composition, distribution, and abundance along the coastal wetlands of China. In estuarine ecology science we investigated the impact of fast sea-level rising on the salt marsh along China coast, the self-organizing behavior of ecological patterns, and the benthic bacterial diversity in submarine groundwater along the coast of the Yellow Sea.

在近海海洋环境方面，通过分析东海沉积物中的黑碳分布和存储探讨了陆架边缘碳循环的过程，研究了东海碳循环中溶解有机碳的生物可利用性，揭示长江河口及临近海域颗粒态有机物的季节性变化特征。通过模拟、水文和生化资料分析揭示了探讨了东海底层水体缺氧受水体密度分层和浮游植物呼吸作用的影响机制。

In the marine environmental science, SKLEC scientists investigated the black carbon in the sediment, bioavailability of dissolved organic carbon, and organic carbon flux and particulate organic matter composition in the East China Sea or in the Arctic valley glaciers. Through in-situ data and numerical modeling, we also discovered the effects density stratification and dark plankton respiration in the formation of hypoxic zone outside the Changjiang Estuary.

科研课题与进展
Research Programs and Highlights

此外，实验室紧密结合国民经济和社会发展需求，努力解决沿海地区有关重大工程中的关键科学技术问题，为沿海地区国民经济建设和公众教育服务。受国家海洋局东海环境监测中心委托，为海洋放射性样品检测提供技术支持。受南京地质调查中心委托，进行重大水利工程对长江下游地质环境的影响研究。受上海城投原水有限公司青草沙水库管理分公司的委托，进行青草沙水库库区植被变化特征、生态效应与有效调控，底泥活性三维表征与评估的研究。受福建四创软件有限公司的委托，进行上海市天文潮风暴潮预报系统的升级和咸潮入侵数值预报系统的建设。受中国医学科学院病原生物学研究所的委托，进行新型冠状病毒应急处置及相关关键技术的研究。

Furthermore, in order to meet the increasing social and economical demands, SKLEC scientists were actively involved in the research that solved the key issues in coastal area developments to provide scientific instructions for the policy makers and to serve the public educations. Some of these researches are listed as follows. SKLEC scientists assisted East China Sea Environmental Monitoring Center, SOA to develop the detecting techniques of marine radioactive samples. We studied the impacts of major hydraulic engineering constructions on the geomorphological environment in lower Yangtze River, commissioned by Nanjing Center of China Geological Survey. In order to guarantee the safe freshwater supply of Shanghai City, we studied the vegetation variability, ecological efficiency, lower sediment activity, and the effective managements strategy of Qingcaosha Reservoir, under the request of Shanghai Chengtou Raw Water Co., Ltd.. The forecasting system of astronomic tide and storm surge in Shanghai was upgraded, and the saltwater intrusion forecasting system was built in collaboration with Fujian Sichuang Software Co., Ltd.. Commissioned by Institute of Pathogen Biology as well as the Chinese Academy of Medical Sciences & Peking Union Medical College, an emergency processing and key technology study of new type of Cov-virus was also implemented.

河口演变规律与河口沉积动力学
Estuarine Evolution and Sedimentation Dynamics

Decadal morphological evolution of the Yangtze Estuary in response to river input changes and estuarine engineering projects

Hua Long Luan, Ping Xing Ding, Zheng BingWang, Jian Zhong Ge, Shi Lun Yang, ***Geomorphology,*** 2016, 266: 12-23.

The Yangtze Estuary in China has been intensively influenced by human activities including altered river and sediment discharges in its catchment and local engineering projects in the estuary over the past half century. River sediment discharge has significantly decreased since the 1980s because of upstream dam construction and water-soil conservation.We analyzed bathymetric data from the Yangtze Estuary between 1958 and 2010 and divided the entire estuary into two sections: inner estuary and mouth bar area. The deposition and erosion pattern exhibited strong temporal and spatial variations. The inner estuary and mouth bar area underwent different changes. The inner estuary was altered from sedimentation to erosion primarily at an intermediate depth (5–15 m) along with river sediment decline. In contrast, the mouth bar area showed continued accretion throughout the study period. The frequent river floods during the 1990s and simultaneously decreasing river sediment probably induced the peak erosion of the inner estuary in 1986–1997. We conclude that both sediment discharge and river flood events played important roles in the decadal morphological evolution of the Yangtze Estuary. Regarding the dredged sediment, the highest net accretion rate occurred in the North Passage where jetties and groins were constructed to regulate the navigation channel in 1997–2010. In this period, the jetties induced enhanced deposition at the East Hengsha Mudflat and the high accretion rate within the mouth bar area was maintained. The impacts of estuarine engineering projects on morphological change extended beyond their sites.

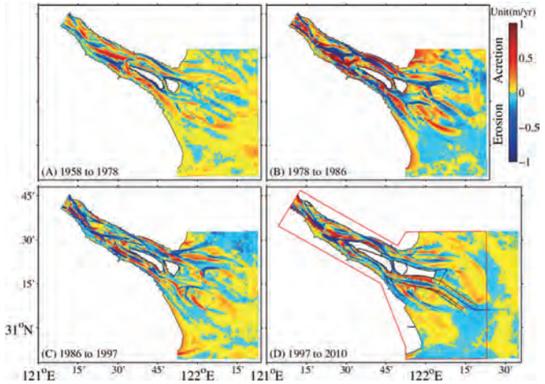


Fig. 5. Erosion and deposition patterns of the Yangtze Estuary at non-uniform decadal intervals from 1958 to 2010. The polygon in (D) represents the boundary used for computing.

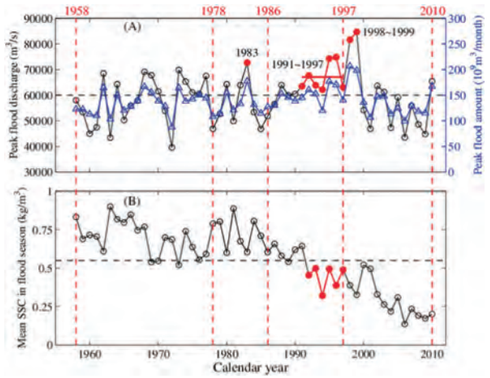


Fig. 7. Peak flood discharge (circles) and flood amount (triangles) (A), and mean SSC of the flood season (June to October) (B) measured at Datong. The data are from Yun (2004). The horizontal dashed line in (A) represents 60,000 m^3 s^{-1}, which is thought to be the dominant discharge required for significant bed-level change in the Yangtze Estuary. The horizontal dashed line in (B) represents 0.55 kg m^{-3}, which is the mean value of SSC in the flood season. The vertical dashed lines represent the years in which bathymetric maps were collected.

Decadal changes in bathymetry of the Yangtze River Estuary: Human impacts and potential saltwater intrusion

Shuaihu Wu, Heqin Cheng, Y.Jun Xu, Jiufa Li, Shuwei Zheng, Estuarine, ***Coastal and Shelf Research,*** 2016, 182: 158-169.

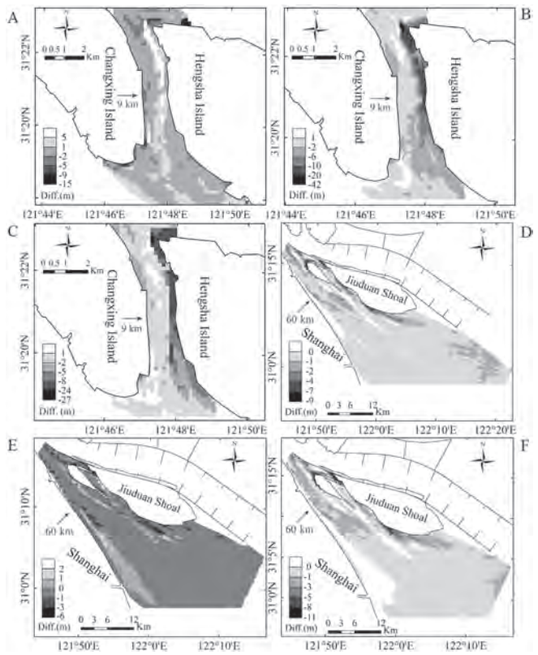


Fig.6.Bathymetric elevation changes in the Hengsha Passage from 2002 to 2007 (A), 2007 to 2013 (B) and 2002 to 2013 (C), and in the South Passage from 2002 to 2010 (D), 2010 to 2013 (E) and 2002 to 2013 (F) (negative values means erosion, positive values means deposition).

This study analyzed bathymetric changes of the 77-km Yangtze River Estuary in China over the past ten years in order to understand the impacts of recent human activities on the estuary of a large alluvial river. Morphological changes were assessed by analyzing digitized bathymetric data of the estuarine channels from 2002 to 2013. Additionally, multi-beam bathymetric measurements made in 2012, 2014 and 2015 were utilized to investigate microtophographic bedforms of the lower reach of the estuary. Our results showed that the middle and upper reaches of the Yangtze River Estuary experienced substantial channel bed erosion in the past 10 years, and that the recent human activities have contributed to the change. These included the construction of a 70 km^2 reservoir along the Yangtze River Estuary, the Qingcaosha Reservoir, for drinking water supply for the City of Shanghai, which has caused progressive bed erosion in the North Channel. The net volume of channel erosion in the Hengsha Passage from 2002 to 2013 was 0.86x10^8 m^3. A large amount of the eroded sediment was trapped downstream, causing overall accretion in the upper reach of the North Passage. The middle and upper reaches of the South Passage also experienced intense erosion (0.45x10^8 m^3) in the past ten years, while high accretion occurred in the lower reach because of the Deepening Waterway Project. The channel dredging left a large range of dredging marks and hollows in the North Passage. The increasing saltwater intrusion found in the Yangtze River Estuary may have been a consequence of either dredging or erosion, or both combined.

Wave and vegetation effects on flow and suspended sediment characteristics: A flume study

X.Y. Wang, W.M. Xie, D. Zhang, Q. He, Estuarine, ***Coastal and Shelf Research,*** 2016, 182: 1-11.

Vegetation in tidal flats can alter flow dynamics by increasing the velocity gradient and attenuating the wave energy. In this study, a flume experiment was performed using the pioneer plant Scirpus mariqueter and suspended sediment. Two cases are analysed: current-only and current-wave conditions with a regular wave. A statistical method is used to analyse the average velocity and the turbulence intensity. Results demonstrate that the plants can cause a velocity decrease in the vegetation region and an increase in the turbulence intensity below the top of the canopy. The combined effect of waves and vegetation on turbulence dramatically increases the flow velocity above the average water depth as well as the turbulence intensity profiles. In this study, the attenuation efficiency of the wave height is 0.0448 m^{-1}, which is identical to results using artificial plants with the same relative submerged depth. The drag force in current-wave conditions is almost twice of that observed in current-only conditions. The spectral analysis shows that only waves can influence high-frequency motion. In addition, an increase is observed in the bottom shear stress, mean grain size, and suspended concentration of the sediment during current-wave conditions.

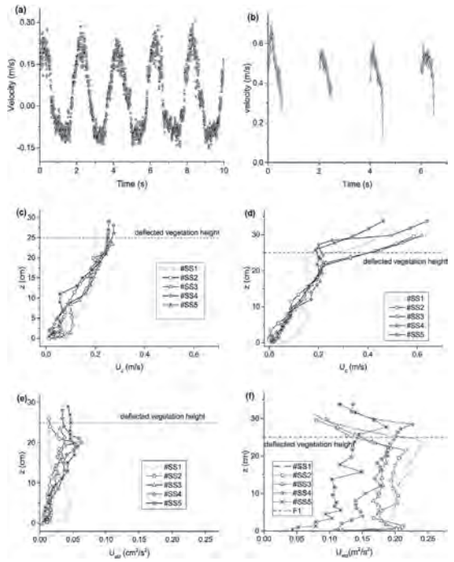


Fig. 3. Averaged velocity profiles of the (a) #SS1 instantaneous velocity at z=1.3 cm for current-wave conditions, (b) #SS1 instantaneous velocity at z=31.54 cm for current-wave conditions, (c) U_c for current-only conditions, (d) U_c for current-wave conditions, (e) U_{std} for current-only conditions, and (f) U_{std} for current-wave conditions.

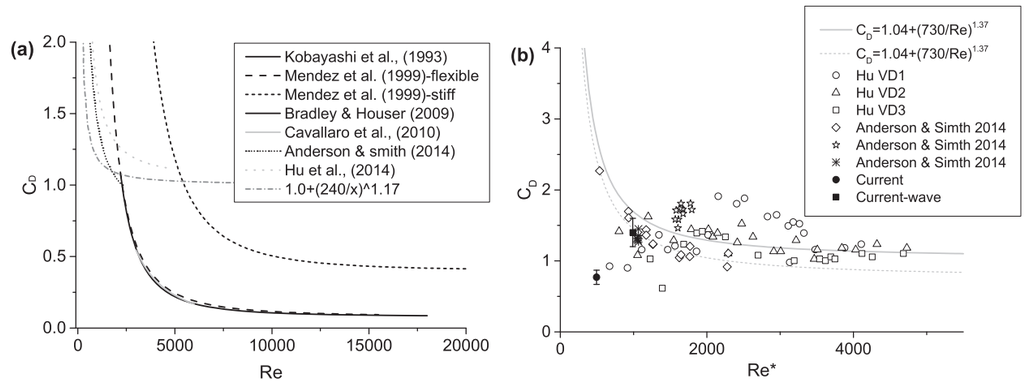


Fig. 6. Relationship between Re/Re* and the period-averaged drag coefficients: (a) experimental equations and (b) experimental results.

The response time of the Changjiang plume to river discharge in summer

Rui Yuan, Hui Wu, Jianrong Zhu, Lu Li, ***Journal of Marine Systems,*** 2016, 154: 82-92.

A three-dimensional numerical model was used to study the response time of the Changjiang (Yangtze) River plume to river discharge by artificially increasing the runoff over a short period and investigating the variation of salinity in the plume region. The time lagged between the change of river discharge and the change of salinity that reaches the 10% of the adjusted value is considered as the response time in this study. The response times in the plume region differed slightly when the river discharge during the spring tide and the neap tide was increased. Specifically, the response times near the river mouth and in the plume edge were ~1 days and more than 15 days, respectively. The brackish water volumes were also calculated to determine the variations in the plume extensions over time. A tracer was released to study the transport time from the Datong station to the East China Sea using the concept of water age. The tracer transport time ranged from 10 days near the river mouth to more than 50 days at the edge of the plume, which is much longer than the response time of the surface salinity.

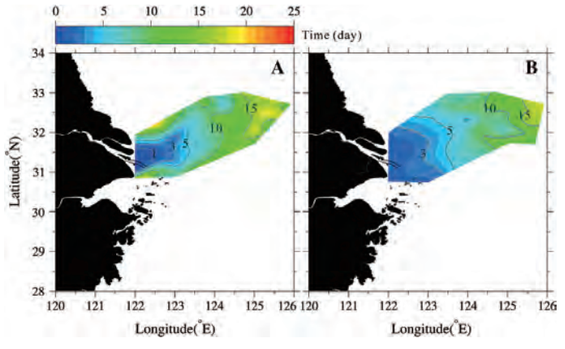


Fig. 9. The response time (unit: day) distribution derived from (A) Exp2 and (B) Exp3.

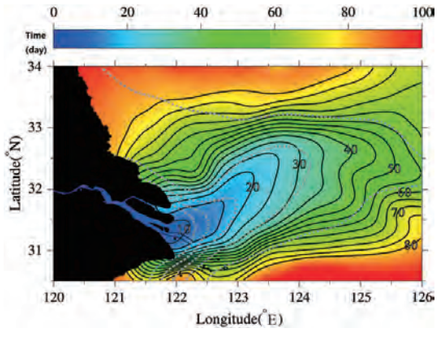


Fig. 13. The mean water age distribution in July at the surface layer. The black isohalines indicate the water age (interval of 5 days), and the dashed gray isohalines indicate the surface salinity.

The influence of human activities on morphodynamics and alteration ofsediment source and sink in the Changjiang Estuary

Lei Zhu, Qing He, Jian Shen, Ya Wang, ***Geomorphology,*** 2016, 273: 52-62.

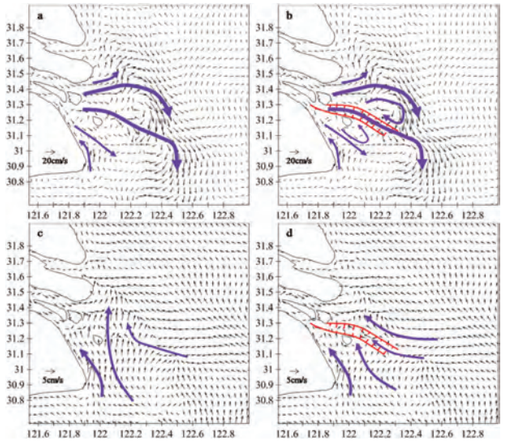


Fig. 7. M_2 tidal constituent-induced residual current in the dry season (top: surface residual current; bottom: bottom residual current; a, c: 1997; b, d: 1997 with training walls).

Several works have discussed the morphological evolution in the Changjiang Estuary (CJE) in recent years. The erosion of its subaqueous delta in recent decades has been ascribed to a decline in fluvial sediment input. However, the interaction between the reduction of riverine sediment load and human activities in the estuary that could have caused morphological change has not been considered. In this work we provide evidence on the morphological evolution around the delta front zone since 1986 and use a numerical model to explore the correlation between the change in hydrodynamics and the evolution pattern. Bathymetric data analysis suggests a decrease of net accretion rate from 16.7 mm/year (1986–1997) to 9.1 mm/year (1997–2010) in the study area. Spatially, the tidal flats accreted whereas the subaqueous delta switched from deposition between 1986 and 1997 to erosion between 1997 and 2010. We used two indicators, tidal energy dissipation and erosion rate, to quantify the change in hydrodynamics and found that the erosion of the subaqueous delta in recent decades can readily be explained by the alteration of the hydrodynamics. The newly built navigation training works in the North Passage had a significant effect on the estuarine hydrodynamics, resulting in a local morphological adjustment. This erosion generated a new source of sediments to maintain the high suspended sediment concentration and tidal flat progradation. The erosion of the subaqueous delta may continue and gradually slow down until the altered hydrodynamics and morphology reach an equilibrium state in the future.

Changes in monthly flows in the Yangtze River, China – With special reference to the Three Gorges Dam

Jing Chen, Brian L. Finlayson, Taoyuan Wei, Qianli Sun, Michael Webber, Maotian Li, Zhongyuan Chen, ***Journal of Hydrology,*** 2016, 536: 293-301.

Much has been written on the hydrology of the Yangtze River in China, especially since the construction of the Three Gorges Dam. Given the range of views in the literature on the impacts of dams and other natural and anthropogenic activities in the catchment on monthly flows, we here set out to analyse the behavior of monthly flows over the period of record 1955–2014. In the literature, the Three Gorges dam has been singled out for particular comment, mostly adverse. In this paper we analyse trend in temperature, precipitation and discharge of the Yangtze River at the monthly time scale over a period that includes the 11 years since the Three Gorges Dam came into operation. The results show that for the upper basin, there has been a marked increase in discharge in the low flow months of January to March that began abruptly in 2003 and an abrupt decrease in flow in October at the same time. Similar changes are found for discharge from the lower basin but in that case the changes have occurred gradually over the period of record. These changes are the outcome of the operation of hydroelectric and flood control dams that have been built continuously in the lower basin since 1955 while in the upper basin the building of the Three Gorges Dam began a phase of rapid dam building not seen in the lower basin. The decreased flows in the late summer and autumn are not of sufficient magnitude to cause any problems for navigation or water supply. The enhanced flows in the winter low flow period are beneficial in that they reduce the likelihood of salt water intrusions in the estuary adversely affecting the supply of freshwater to Shanghai.

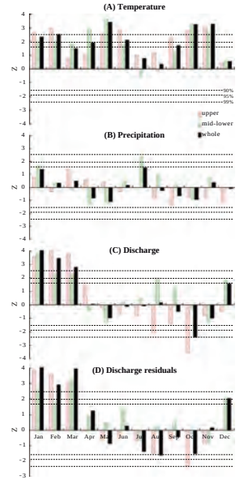


Fig. 3. Trends of monthly temperature (A); monthly precipitation (B); and monthly discharge (C); residuals from multiple regression of discharge against temperature, precipitation and precipitation in the preceding month (D). Trends were calculated using the method of Mann–Kendall and lines delimiting the level of significance (90%, 95% and 99%) are shown in each case.

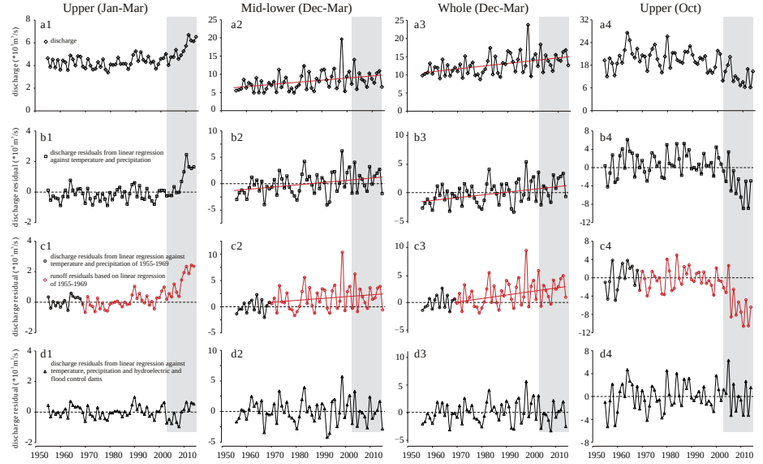


Fig. 6. Discharge records for those months which show significant trend over the period 1955–2014 (a1–4). Residuals from regression of discharge against precipitation and temperature for the discharges in a1–4 (b1–4). Residuals as for b1–4 but using regression only for the period 1955–1969 (c1–4). Residuals from regression of discharge against precipitation, temperature and hydroelectric and flood control dam capacity for the discharges in a1–4 (d1–4). Shaded area to the right of each plot is the period after the completion of the Three Gorges Dam.

Magnetite with anomalously high Cr_2O_3 as a fingerprint to trace upper Yangtze sediments to the sea

Wei Yue, James T. Liu, Dan Zhang, Zhanghua Wang, Baocheng Zhao, Zhongyuan Chen, Jing Chen, ***Geomorphology,*** 2016, 268: 14-20.

This paper examines geochemical properties of detrital magnetite, in order to link sediments in a Plio-Quaternary core taken in the delta area to their sources in the Yangtze River basin. A total of 40 sediment samples were collected fromboth themain river channel/tributaries and a sediment core fromthe Yangtze delta. The geochemical compositions of detrital magnetite in these sediments were analyzed by electron microprobe, including FeO, TiO_2, CoO,MgO, Cr_2O_3, MnO, ZnO, Al_2O_3 and V_2O_3. The results revealed that the detrital magnetite grains with anomalously high Cr_2O_3 occurred exclusively in the upper reaches of the Yangtze (upstreamof the Three Gorges Dam), where the E'mei Basalt block is located. This type of magnetite could therefore be considered a unique sediment proxy of the upper river basin to help identify sediment source in the delta area. Our analysis found such magnetite grains with high Cr_2O_3 occurring throughout the core depth above 186.5m, in contrast to the extremely low Cr_2O_3 below this depth. The boundary between high and low Cr_2O_3 in magnetite grains of the core sediments was dated by paleomagnetism at ca. ~1.2–1.0 Ma, signifying that the linkage between the Yangtze River course and the sea was before ~1.2–1.0 Ma. This demonstrates that the sediment provenance of the Yangtze delta has experienced a change from local to distal Yangtze River, which took place with the uplift of the Tibetan plateau and coastal subsidence during the Plio-Quaternary.

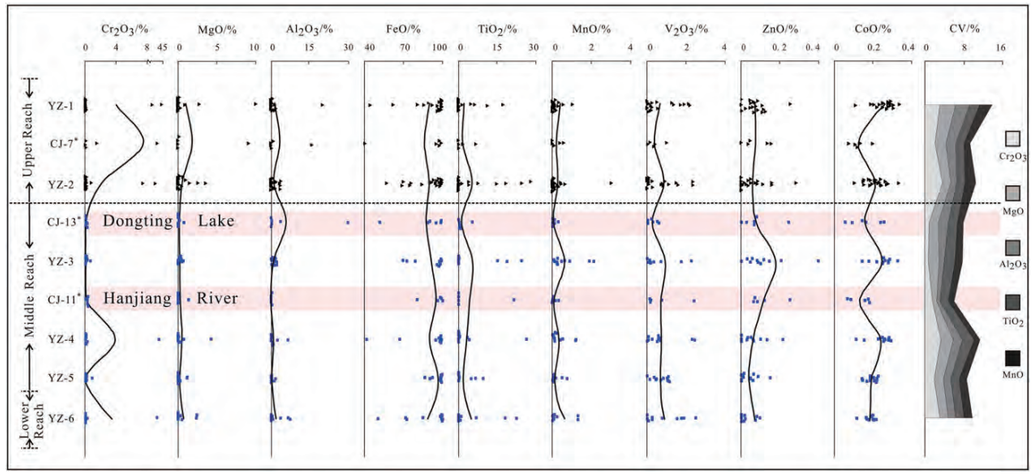


Fig. 2. Element oxide concentrations and coefficients of variability (CV) of themagnetite grains in the Yangtzemainstreamand tributaries. The data of CJ-7, CJ-13 and CJ-11was fromWang et al. (2007). The pink bar marked the samples of tributaries.

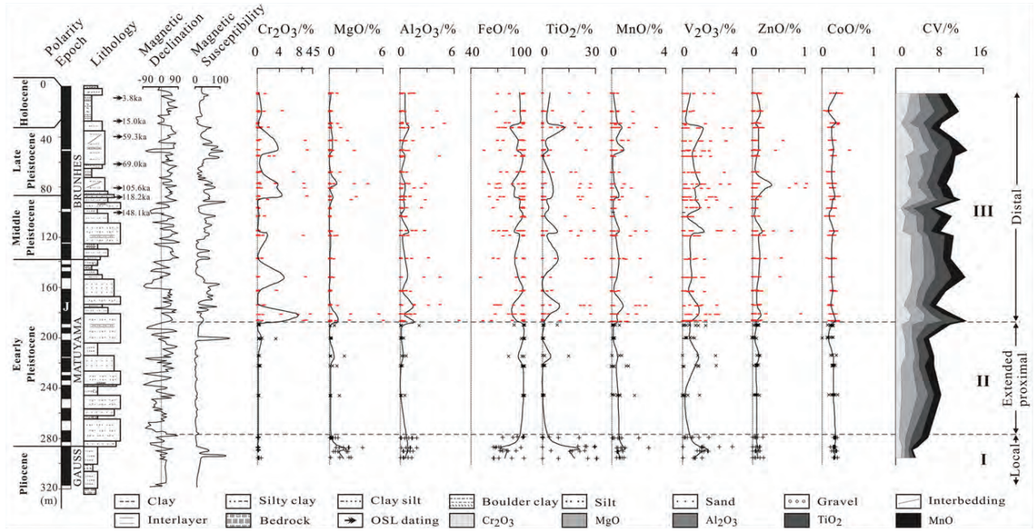


Fig. 3. Elemental oxide concentrations in magnetite grains of core SG7 (paleo-magnetic results and OSL dating were from Wang et al., 2008a, 2008b).

Magnetic properties of sediments of the Red River: Effect of sorting on the source-to-sink pathway and its implications for environmental reconstruction

Thi Thu Hien Nguyen, Weiguo Zhang, Zhen Li, Jie Li, Can Ge, Jinyan Liu, Xuexin Bai, Huan Feng, and Lizhong Yu, ***Geomorphology,*** 2016, 268: 14-20.

We conducted a mineral magnetic study of river bank and subaqueous delta sediments from the Red River, in order to examine the role of sedimentary sorting on the variation of sedimentary magnetic properties from source to sink. The magnetic mineralogy mainly consists of magnetite and hematite. Bulk sediment particle-size variations have a strong influence on magnetic properties, with the frequently used magnetic parameters vfd%, vARM, vARM/v, and vARM/SIRM exhibiting positive correlations with the <4 mm fraction, while S-ratios are negatively correlated with this fraction. Compared with river bank sediments and shallow shoreface (<5 m water depth) sediments, sediments from the deeper (>5 m water depth) part of the subaqueous delta have lower v and SIRM values, a finer ferrimagnetic grain-size and higher proportions of hematite, consistent with selective loss of coarse ferrimagnetic grains on the source-to-sink pathway. We suggest that variations in magnetic properties in response to particle-size compositions and therefore depositional environment changes should be carefully addressed when magnetic proxies such as vARM/SIRM are used in the study of coastal and marine environmental changes (e.g., sea-level change). In such cases, the combined use of magnetic properties and geochemical indicators, such as Al/Ti ratio, may provide better results for paleoenvironmental reconstruction.

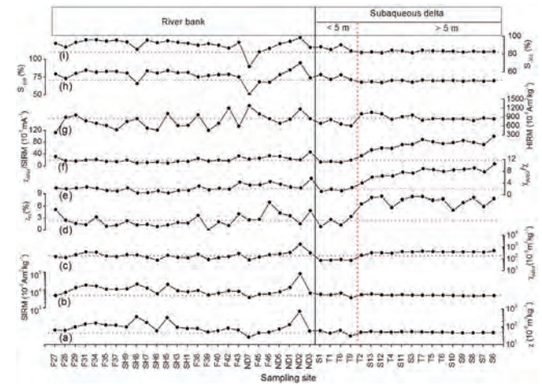


Figure 3. Spatial variation of magnetic properties of the river bank and subaqueous sediments. The fluvial samples are arranged in order from upstream down to the coast. The subaqueous delta samples are grouped into shoreface (water depth <5 m) and prodelta (water depth >5 m) zones. The red lines depict the mean values either for the (d–f) river bank or the (a–c and g–i) prodelta sediments. (a and b) The river bank sediments have relatively high v and SIRM values, suggesting higher ferrimagnetic mineral concentrations. Sediments from the prodelta have higher vfd%, vARM/v, vARM/SIRM values (Figures 3d–3f), which suggests that the ferrimagnetic minerals become finer in the prodelta sediments.

Dramatic variations in emergent wetland area in China's largest freshwater lake, Poyang Lake

Xuefei Mei, Zhijun Dai, Sergio Fagherazzi, Jiyu Chen,***Advances in Water Resources,***2016, 96: 1-10.

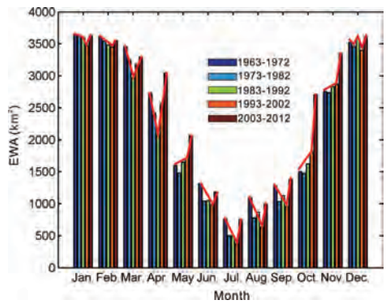


Fig. 9. Decadal variations of monthly exposed wetland area (EWA) from 1963 to 2012, the red curve denotes the decadal EWA fluctuation pattern in each month. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Freshwater wetlands are important ecosystems experiencing rapid degradation around the world. As much as 64% of world's wetland area has been lost since 1900; the situation is even more serious in Asia, where land reclamation and anthropogenic modifications of rivers are increasing the rate of wet- land disappearance. In this study, we provide a first complete estimation of daily Emergent Wetland Area (EWA) in Poyang Lake, China's largest freshwater lake, from 1955 to 2012. A wavelet analysis indicates a strong periodicity in the monthly EWA time series with two oscillations having a period of 12 and 60–72 months, respectively. A dramatic increase in mean annual EWA is detected since 2003, when the Three Gorges Dam (TGD) was completed, mainly due to the seasonal drying of 1078 km^2 of wetlands in October. It is found that the timing of wetland emergence during the dry season has been anticipated of one month, from November to October, since the establishment of TGD. It is argued that a significant increase in wetland exposure and an observable shift in the seasonal timing of flooding and drying will seriously degrade the wetland system and threaten the endangered migratory birds that inhabit it unless effective countermeasures are implemented.

Decline in suspended sediment concentration delivered by the Changjiang (Yangtze) River into the East China Sea between 1956 and 2013

Zhijun Dai, Sergio Fagherazzi, Xuefei Mei, Jinjuan Gao, ***Geomorphology,*** 2016, 268: 123-132.

The temporal evolution of suspended sediment concentration (SSC) in a river debouching into the ocean provides vital insights into erosion processes in the watershed and dictates the evolution of the inner continental shelf. While the delivery of sediment from rivers to the ocean has received special attention in the recent past, few studies focused on the variability and dynamics of river SSC, especially in the Changjiang (Yangtze) river, China, the longest river in Asia. Here, variations in SSC delivered by the Changjiang River to the East China Sea and possible causes of its variability were detected based on a long-term time series of daily SSC and monthly water discharge measured at the Datong gauging station. The SSC data are further compared to a hydrological analysis of yearly precipitation covering the entire catchment. The results indicate the presence of a decline in SSC in the period 1956–2013,which can be divided into three phases: (i) high SSC (0.69 kg/m^3) in the wet season and low SSC (0.2 kg/m^3) in the dry season from 1956 to 1970; (ii) relative high SSC (0.58 kg/m^3) in the wet season and low SSC (0.15 kg/m^3) in the dry season from1971 to 2002; and (iii) low SSC (0.19 kg/m^3) in the wet season and very low SSC (0.09 kg/m^3) in the dry season after 2002. These three periods have a mean yearly SSC values of 0.62, 0.42, and 0.18 kg/m^3, respectively. Compared with 1956–1970, the slope of the rating curve between SSC and water discharge decreased, respectively, by 2% and 30% during the period 1971–2002 and 2002–2013. Soil erosion, dam construction, and banks reinforcement along the Changjiang River are the main causes of SSC variations. Fluctuations in water discharge are also controlling the SSC long-termvariations. Specifically, from 1956 to 1970, the effect of soil erosion overrules that of dam impoundment, which is likely responsible for the high SSC; during the period 1970–2002, the influence of dam impoundment increases while that of soil erosion decreases, which together produce a small reduction in SSC. Since 2002, the impact of soil erosion further decreases and large-scale sediment trapping behind the Three Gorges Dam is responsible for the occurrence of extremely low SSC. The results presented herein for the Changjiang River can inform a better management strategy of sediment resources and water quality for both the river and the coast. Our conclusions can be well applied to other rivers discharging in the ocean subject to similar human activities.

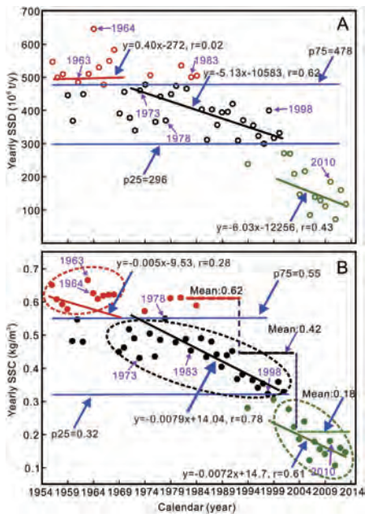


Fig. 2. Long-term changes in suspended sediment discharge (SSD) and suspended sediment concentration (SSC). (A) Changes in SS); (B) Changes in SSC. The values 0.62, 0.42, 0.18 kg/m^3 represent the yearly mean in SSC for the periods 1956–1970, 1971– 2002, and 2003–2013, respectively. The 25th and 75th percentiles are also indicated.

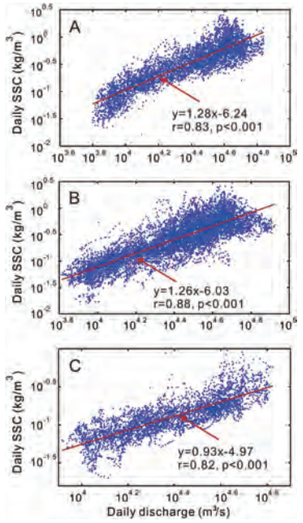


Fig. 9. Relationships between daily SSC and daily water discharge: (A) 1956–1970; (B) 1971–2002; (C) 2003–2013).

Recent morphodynamic evolution of the largest uninhibited island in the Yangtze (Changjiang) estuary during 1998-2014: Influence of the anthropogenic interference

Wen Wei, Xuefei Mei, Zhijun Dai, Zhenghong Tang, ***Continental Shelf Research,*** 2016, 124: 83-94.

Estuarine geomorphology worldwide has greatly changed in the Anthropocene due to intensive human inferences in river basin and within estuary, which has received increasing global concerns. Here, recent morphodynamic evolution of Jiuduan Shoal (JDS), the largest uninhabited island in theYangtze (Changjiang) Estuary, and associated controlling factors were analyzed based on unique high-resolution seasonal-surveyed bathymetric data during1998–2014.It can be indicated that JDS presents novel 12 and 48 months fluctuations though significant accretion was detected on high flats above - 2m. Meanwhile, morphodynamic evolution of JDS during1998–2014 was divided into three stages: significant siltationon landward half of north JDS and expanding of Jiangya Shoal (JYS,partofJDS) tail, but less accretion at high flats from 1998 to 2002; continuous variations of JYS and reshape of seaward JDS with erosion band and heave appearance from 2002 to 2006; retentive alteration of JYS but recovery of erosion band and heave, together with redistribution of sand between high and low flats on seaward JDS after 2007. Moreover, river discharge could be likely the key factor controlling periodic characteristics of recent JDS evolution. Deep waterway project (DWP) dominates area increase of JDS by inducing accretion in north edge and south edge of Lower Shoal between 1998 and 2014.

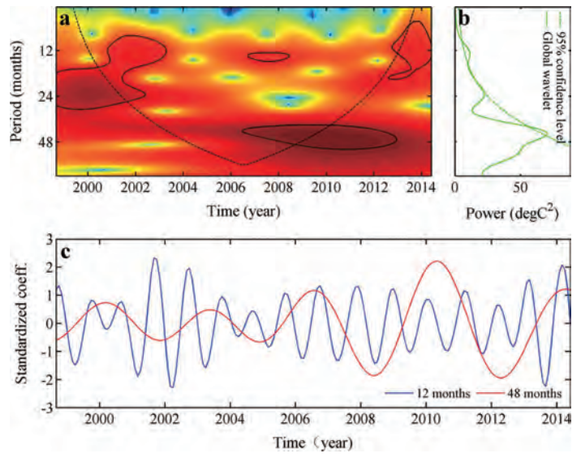


Fig. 3. Wavelet analysis on area changes of JDS above-5m:(a)contoured coefficient; and(b)time series of periods (namely1,3–4 and 6–7yr)extracted from corresponding contours.

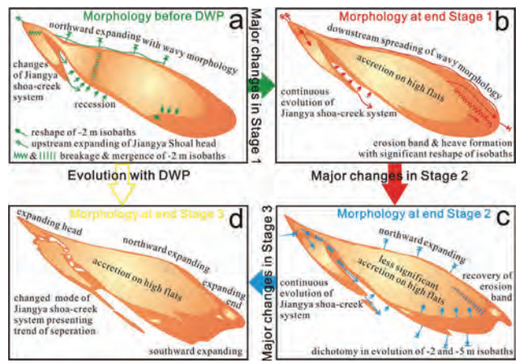


Fig. 8. Graphical representation for evolution of JDS, with (a) morphology of JDS before DWP and corresponding bathymetric changes during Stage1; (b) morphology atend Stage1 and changes during Stage2; (c) morphology at end Stage 2 and changes during stage 3;and (d) final state of JDS after years of adjustment since accomplishment of DWP and major changes relative to state before DWP. Times when corresponding significant bathymetric changes occurs are labeled.

Linking the infilling of the North Branch in the Changjiang (Yangtze)estuary to anthropogenic activities from 1958 to 2013

Zhijun Dai, Sergio Fagherazzi, Xuefei Mei, Jiyu Chen, Yi Meng, ***Marine Geology,*** 2016, 379: 1-12.

Many tidally-dominated estuaries of the world are experiencing variations in bottom topography due to changes in natural forcings and intensive human activities. Here we focus on the morphological evolution of the North Branch (NB), a tidally-dominated distributary of the Changjiang estuary. Our analysis is based on long-term bathymetric and hydrological data collected between 1950 and 2010. The results show that mean water depth, channel volume below 0 m, and channel volume below 5 m have respectively decreased by 43%, 53% and 92% in the last 50 years. A reduction of the whole estuarine surface with aggradation in elongated tidal sand bars and erosion at themouth are the main morphological variations of the NB, while a decrease in channel volume below−5m due to infilling is the second mode of morphological change. While the drastic decrease in sediment load from upstream is likely unrelated to the silting of the NB, local land reclamation along the banks is directly responsible for the reduction of estuarine surface area and related tidal prism. Between 1958 and 2013, enhanced flood-tide currents resulted in a large import of sediments from offshore into the NB, triggering a sustained decrease in channel volume below 0 m. It is argued that the recovery of the funnel-shaped configuration of the estuary by restoring mud flats over 0m, dredging the southern part of the estuary bend and forbidding land reclamation could prevent the silting of the NB, otherwise the NB will likely vanish in few decades.

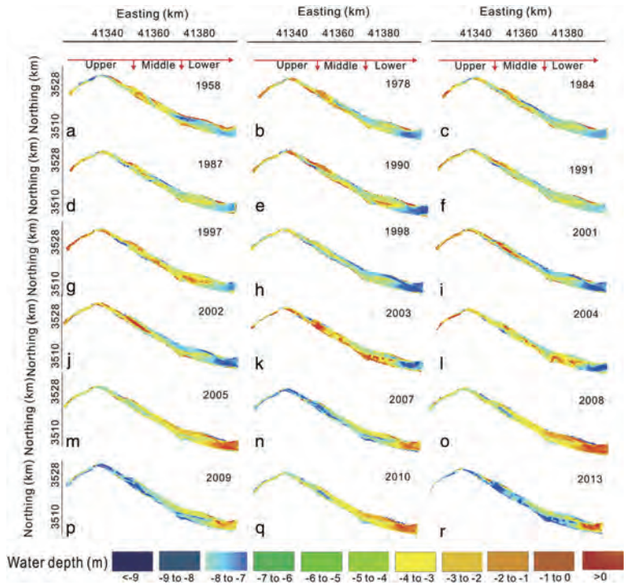


Fig. 2. Water depths below 0 m along the North Branch in different years.

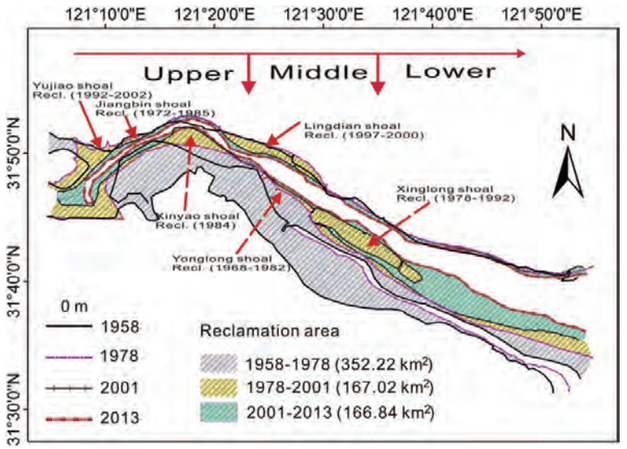


Fig. 13. Land reclamation in the North Branch from 1958 to 2013.

Net anthropogenic nitrogen inputs (NANI) into the Yangtze River basin and the relationship with riverine nitrogen export

Fei Chen, Lijun Hou, Min Liu, Yanling Zheng, Guoyu Yin, Xianbiao Lin, Xiaofei Li, Haibo Zong, Fengyu Deng, Juan Gao, and Xiaofen Jiang, ***Journal of Geophysical Research: Biogeosciences,*** 2016, 121: 451-465.

This study investigated net anthropogenic nitrogen inputs (NANI, including atmospheric nitrogen deposition, nitrogenous fertilizer use, net nitrogen import in food and feed, and agricultural nitrogen fixation) and the associated relationship with riverine dissolved inorganic nitrogen (DIN) export in the Yangtze River basin during the 1980–2012 period. The total NANI in the Yangtze River basin has increased by more than twofold over the past three decades (3537.0 ± 615.3 to 8176.6 ± 1442.1 kgNkm^{-2}yr^{-1}). The application of chemical fertilizer was the largest component of NANI in the basin (51.1%), followed by net nitrogen import in food and feed (26.0%), atmospheric nitrogen deposition (13.2%), and agricultural nitrogen fixation (9.7%). A regression analysis showed that the riverine DIN export was strongly correlated with NANI and the annual water discharge (R^2 = 0.90, p<0.01). NANI in the Yangtze River basin was estimated to contribute 37–66% to the riverine DIN export. We also forecasted future variations in NANI and riverine DIN export for the years 2013 to 2030, based on possible future changes in human activities and the climate. This work provides a quantitative understanding of NANI in the Yangtze River basin and its effects on riverine DIN export and helps to develop integrated watershed nitrogen management strategies.

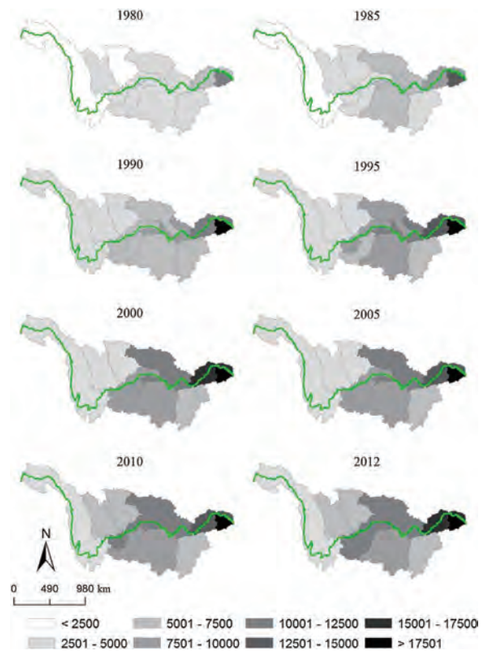


Figure 2. NANI (kg N km^{-2} yr^{-1}) in different subcatchments of the Yangtze River basin presented in a GIS map.

Precipitation and temperature changes in the major Chinese river basins during 1957–2013 and links to sea surface temperature

Qing Tian, Matthias Prange, Ute Merkel, ***Journal of Hydrology,*** 2016, 536: 208-221.

The variation characteristics of precipitation and temperature in the three major Chinese river basins (Yellow River, Yangtze River and Pearl River) in the period of 1957–2013 were analyzed on an annual and seasonal basis, as well as their links to sea surface temperature (SST) variations in the tropical Pacific and Indian Ocean on both interannual and decadal time scales. Annual mean temperature of the three river basins increased significantly overall since 1957, with an average warming rate of about 0.19 C/10a, but the warming was characterized by a staircase form with steps around 1987 and 1998. The significant increase of annual mean temperature could mostly be attributed to the remarkable warming trend in spring, autumn and winter. Warming rates in the northern basins were generally much higher than in the southern basins. However, both the annual precipitation and seasonal mean precipitation of the three river basins showed little change in the study area average, but distinct interannual variations since 1957 and clear regional differences. An overall warming–wetting tendency was found in the northwestern and southeastern river basins in 1957–2013, while the central regions tended to become warmer and drier.

Results from a Maximum Covariance Analysis (MCA) showed that the interannual variations of seasonal mean

precipitation and surface air temperature over the three river basins were both associated with the El Niño-Southern Oscillation (ENSO) since 1957. ENSO SST patterns affected precipitation and surface air temperature variability throughout the year, but with very different response patterns in the different seasons. For instance, temperature in most of the river basins was positively correlated with central-eastern equatorial Pacific SST in winter and spring, but negatively correlated in summe

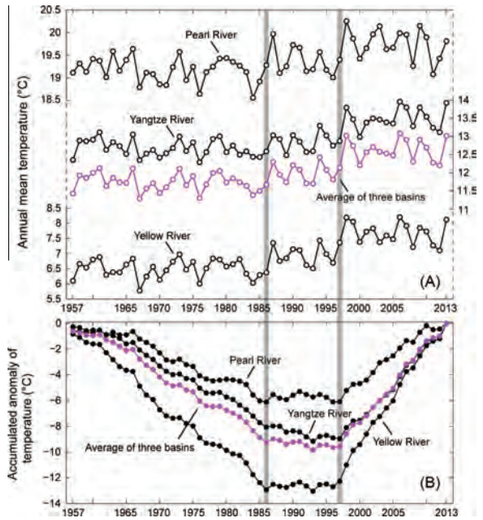


Fig. 5. Annual mean temperature (A) and its Accumulated Anomaly Curve (B) for each of the three river basins. The average over all three basins is denoted by the pink line. The gray bars denote the transitions of the trends according to the Accumulated Anomaly Curve (B). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Bedform genesis in bedrock substrates: Insights into formative processes from a new experimental approach and the importance of suspension-dominated abrasion

Daowei Yin, Jeff Peakall, Dan Parsons, Zhongyuan Chen, Heather Macdonald Averill,Paul Wignall, Jim Best, ***Geomorphology,*** 2016, 255: 26-38.

Bedrock channels are common in the natural environment, and bedrock channel erosion sets the pace of denudation in many river catchments. However, in comparison to the large number of studies concerning the formation of alluvial bedforms, relatively few investigations have concerned bedrock bedform genesis. Field-based analysis of sculptured forms within bedrock channels has been restricted notably by the slow rate of bedform development in such environments. Furthermore, only a limited number of flume-scale experiments have been conducted that attempt to simulate the genesis of sculpted bedforms in bedrock channels. This study demonstrates that optimisation of clay beds through analysis of clay strength enables the development of features analogous to bedrock river channel bedforms—even at a scale that is orders of

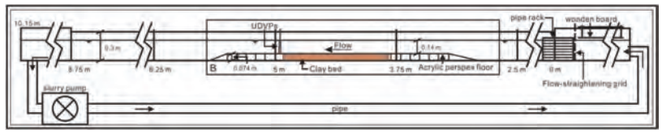


Fig. 1. Schematic drawing of the current experimental setup of the hydraulic slurry flume. The dark area represents the clay bed with a tray that was lowered into position so that the top surface of the clay bed was flush with the surrounding false floor.

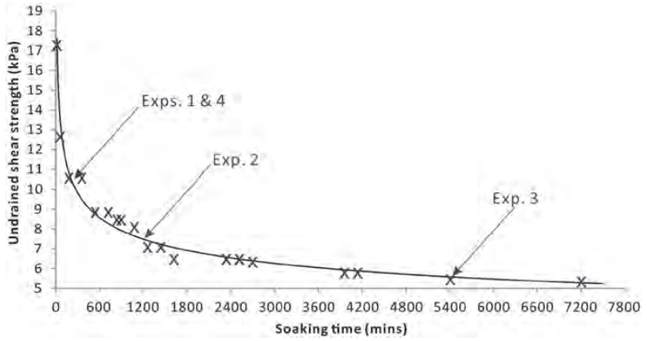


Fig. 2. Variation in undrained shear strength with soaking time. Positions of the initial undrained shear strengths are shown for each experiment; Exps. 1 & 4: hard: 10.5 kPa; Exp. 2: medium: 7.5 kPa; Exp. 3: soft: 5.5 kPa.

magnitude smaller than some natural examples. Three sets of suspended sediment-laden experiments were carried out using hard, medium, and soft clay bed substrates. A suite of erosive bedforms (including potholes, flutes, and furrows) developed on all experimental beds. All observed erosional features have clear equivalents to those observed in natural bedrock rivers. Bed shear strength was found to be a significant factor for the genesis of different types of simulated bedrock bedforms in our experiments with other factors, such as flow velocity, bed slope, and flow depth held approximately constant. Importantly, in a subset of experiments performed with an absence of suspended sediment, fluid flow did not result in the erosion and development of bedforms in the clay bed. Hence, this work illustrates that abrasion by suspended sediments is the key process required for the formation of these simulated bedrock bedforms in our experiments, in the absence of bedload abrasion; other processes such as plucking, cavitation, and dissolution will have been negligible.

Optically stimulated luminescence ages for human occupation during the penultimate glaciation in the western Loess Plateau of China

XIAOMEI NIAN, FENG LI, FUYOU CHEN, WEIGUO ZHANG, YUCHAO ZHAO, JING ZHOU and XING GAO, ***Journal of Quaternary Science,*** 2016, 31(8): 928-935.

The chronology of few Palaeolithic sites in the Loess Plateau of China has been well investigated for the Middle Pleistocene. In this study, the Yangshang Palaeolithic site with significant archaeological remains, located in Gansu Province of the western Chinese Loess Plateau, was dated using blue-stimulated optically stimulated luminescence (OSL) and infrared stimulated luminescence (IRSL) techniques on eight medium-grained (45–63 mm) quartz and polymineral samples through the Palaeolithic sequence. Except for one sample from the upper cultural layer (553 ka), age estimates obtained by quartz OSL dating exceed its upper datable limit, and so an elevated temperature post-IR IRSL SAR protocol was used on 45–63mm polymineral grains to derive a numerical chronology for the site. The luminescence ages of seven samples from six cultural layers lie between 1045 and 22011 ka; for the three main cultural layers the results varied from 1499 to 18610 ka, consistent with the presently observed stratigraphy. The dating results shown that early hominins may have occupied this region in the western Loess Plateau of China during Marine Isotope Stage (MIS) 7, early glacial MIS 6 and early interglacial MIS 5, reflecting their ability to adapt to variable environments.

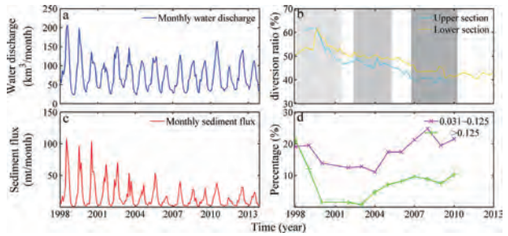


Fig. 9. Changes in riverine loads from Yangtze River, (a,c) monthly water discharge and sediment flux from Yangtze River at Datong station; (b) changes in the ebb flow diversion ratio of North passage through the upper and lower given section; and (d) changes in fraction content of suspended sediment from YangtzeRiver at Datong Station.

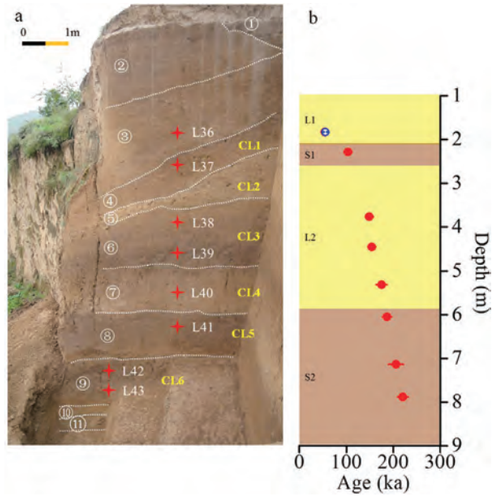


Figure 2. (a) Photograph showing the Yangshang stratigraphic section and the position of the OSL samples. (b) The correlation between the OSL ages and loess– palaeosol sequence at the Yangshang site. The assignment of units L1, S1, L2 and S2 is made on the basis of the new OSL ages and also a combination of lithological characteristics (colour changes/particle size variations). Closed red circles: post-IR IRSL SAR ages; open blue circle: quartz SAR age.

海岸动力地貌与动力沉积过程
Coastal Morphodynamics and Sedimentary Process

Mobile mud dynamics in the East China Sea elucidated using ^{210}Pb, ^{137}Cs, ^{7}Be, and ^{234}Th as tracers
Jinlong Wang, Jinzhou Du, Mark Baskaran, and Jing Zhang, ***Journal of Geophysical Research: Oceans,*** 2016, 121: 224-239.

"Mobile mud" (MM), which has fine grain size distribution (>90% clay+silt, and <5% sand) and high porosity (≥0.50), plays an important role in the biogeochemical cycles in the estuarine areas and the inshore shelf. A suite of MM samples from the coastal area of the East China Sea (ECS) was collected in spring and summer of 2011 to observe their spatial and temporal distribution, grain size, and radionuclides concentrations. The MM thickness ranged from 0.5 to 11 cm (average: 2.2 cm (May) and 3.9 cm (August)). The thick mud layer is mainly distributed along the coast, with an area of 2.2x10^4 km^2 in May and 1.5 x10^4 km^2 in August, with corresponding masses of 8.8x10^8 and 7.8x10^8 t, respectively. The estimated masses of MM are considerably larger than the annual sediment discharge mass of the Changjiang River. The distribution of ^{137}Cs inventories in MM indicates that ^{137}Cs can be effectively utilized as a transport tracer of MM in the river-dominated estuaries and coastal areas. The higher inventories of ^{7}Be in MM in the river mouth in spring are attributed to higher depositional flux and higher sediment discharge. The ratio of the MM inventory of $^{234}Th_{ex}$/ production in the overlying water column of >2.5 in south inshore indicates that the sediment focusing resulted in the increased mass flux. The residence time of MM is estimated as 3 – 6 years both by mass balance of MM and $^{210}Pb_{ex}$ in MM.

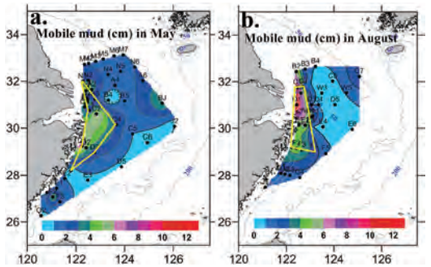


Figure 3. Depth of MM (cm) within the confines of our study area (a) from 15 May 2011 to 4 June 2011 and (b) from 16–26 August 2011. The closed areas denote the thick MM layer used to calculate the MM mass.

Seasonal variation of river and tide energy in the Yangtze estuary, China
Min Zhang, Ian Townend, Yunxuan Zhou and Huayang Cai, ***Earth Surface Processes and Landforms,*** 2016, 41: 98-116.

In many large estuaries there are significant variations in flow conditions due to the interaction between tide (with spring–neap changes) and river discharge (with wet–dry seasons), which is key to understanding the evolution of the morphology and the resultant equilibrium state. To explore whether there exists an equilibrium state, and what might control such a state in such a dynamic environment, both numerical and analytical methods have been used to investigate the relative importance of tide and river contributions to the work done locally and globally over a wide range of discharge conditions in the Yangtze estuary. In particular, we have quantified the contributions from the tidal flow, the river flow and the tide–river interaction in terms of energy and its dissipation under different river discharge conditions. Model results suggest that there is a state of minimum tidal work for the case representing the wet season, when river and tide are doing uniform work locally and minimum work globally, within the bi-directional tidal reach for tide and along the whole estuary for river. We also observe that the system is not optimized for other conditions (peak discharge and low flows during the dry season), but the system would tend to do the minimum work possible given the constraints on the system (e.g. imposed forcing conditions and available sediment supply). Results, therefore, are consistent with the use of these two energetic optimization principles, and the proposed method could be applicable to other alluvial estuaries.

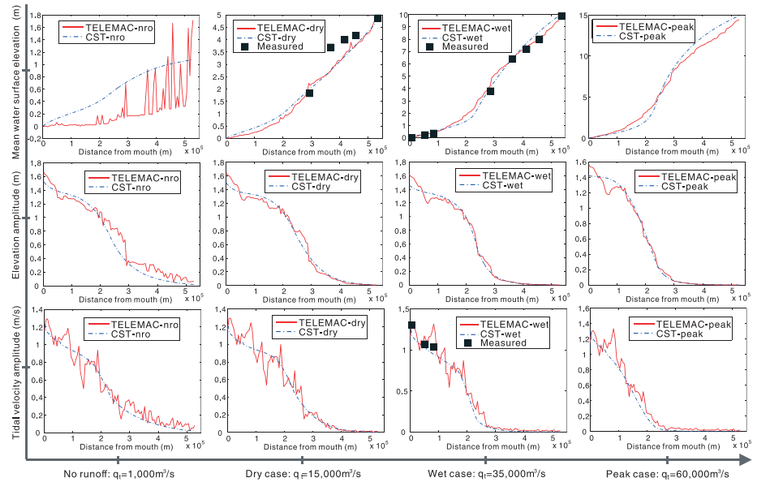


Figure 3. CST model results plotted against TELEMAC results for the Yangtze estuary using parameters derived from hydraulic geometry (Tables II and III). Black points are the field measured data. This figure is available in colour online at wileyonlinelibrary.com/journal/espl

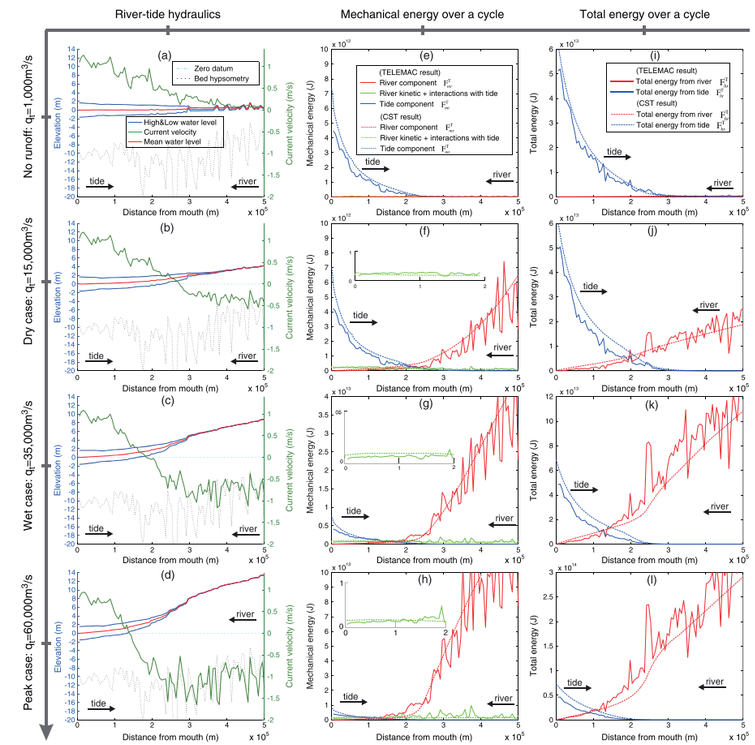


Figure 4. The tidally averaged hydraulic profile (a, b, c, d) and the decomposed mechanical energy (e, f, g, h) and total energy (i, j, k, l) from both river and tide along the Yangtze estuary. This figure is available in colour online at wileyonlinelibrary.com/journal/espl

Signals of typhoon induced hydrologic alteration in particulate organic matter from largest tropical river system of Hainan Island, South China Sea

U.K. Pradhan, Ying Wu, Xiaona Wang, Jing Zhang, Guosen Zhang, ***Journal of Hydrology,*** 2016, 534: 553-566.

Tropical river systems affected by climatic extremes (typhoon) are recognized as significant source of particulate organic matter (POM) delivered to their adjacent seas. Studies on POM composition in typhoon affected rivers of tropical Hainan Island are limited. The Nandu River-Estuary (NRE) is the largest river system on Hainan Island in the South China Sea, affected by frequent typhoons every year. We used elemental contents, stable isotope ratios of organic carbon and lignin phenols to characterize POM compositions in NRE during typhoon affected wet season (August, 2011) vs. normal wet season (October, 2012). Short term and heavy precipitation during typhoon in August, 2011 was evidenced with a significant hydrologic change as well as change in POM composition along the NRE. The multi-proxy results suggest that POM was degraded and their sources significantly changed along the NRE hydrograph. Results from an end member mixing model indicated that POM constituted nearly similar OM input from soil (35%) and freshwater plankton (32%) during August, 2011, in contrast POM dominated with OM from freshwater plankton (51%) during October 2012 in riverine regions of NRE. In the estuarine region, POM constituted dominant inputs from marine plankton during August, 2011 (44%) and October, 2012 (56%) as compared to other sources. Collectively, the nature of POM composition change in the vicinity of typhoon induced copious precipitation, with potential land-use intervention across the Hainan Island are key factors affecting the carbon cycling in NRE and adjacent South China Sea.

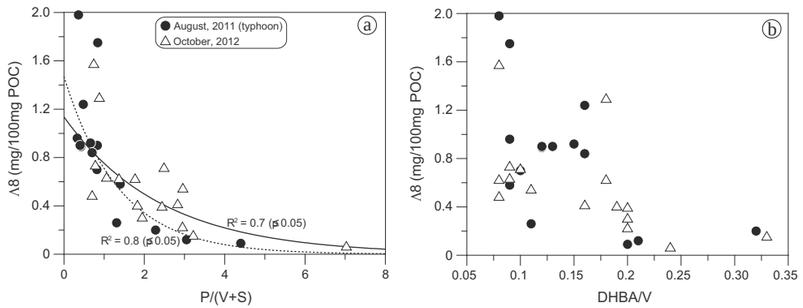


Fig.7. Relationship between K8 and lignin phenol digenetic indicators (a) P/(V + S) and (b) DHBA/V in the POM from NRE during August, 2011 and October, 2012.

Exploring the impacts of multiple tidal constituents and varying river flow on long-term, large-scale estuarine morphodynamics by means of a 1-D model

Leicheng Guo, Mick van der Wegen, Zheng Bing Wang, Dano Roelvink, and Qing He, ***Journal of Geophysical Research: Earth Surface,*** 2016, 121: 1000-1022.

Tidal asymmetry is an important mechanism generating tidal residual sediment transport (TRST) in tidal environments. So far, it is known that a number of tidal interactions (e.g., M_2-M_4 and M_2-O_1-K_1) can induce tidal asymmetry and associated TRST; however, their variability and morphodynamic impacts are insufficiently explored. Inspired by the river and tidal forcing conditions in the Yangtze River Estuary, we explore the morphodynamic development of a 560 km long estuary under the boundary forcing conditions of varyingly combined tidal constituents and river discharges using a schematized 1-D morphodynamic model for long-term (millennial) simulations. We then employ an analytical scheme which integrates sediment transport as a function of flow velocities to decompose the contribution of different tidal interactions on TRST and to explain how the river and tidal interactions control TRST and associated morphodynamics. Model results display varying equilibrium bed profiles. Analytical results suggest that (1) a series of tidal interactions creates multiple tidal asymmetries and associated TRST, (2) river flow modulates tidal asymmetry nonlinearly in space, and (3) more tidal constituents at the sea boundary persistently enhance the seaward TRST through river-tide

interactions. It is the combined effects of multiple tidal asymmetries and river-tide interactions that determine the net TRST and consequent morphodynamic development. It thus suggests that tidal harmonics of significant amplitudes need to be considered properly as boundary conditions for long-term, large-scale morphodynamic modeling.

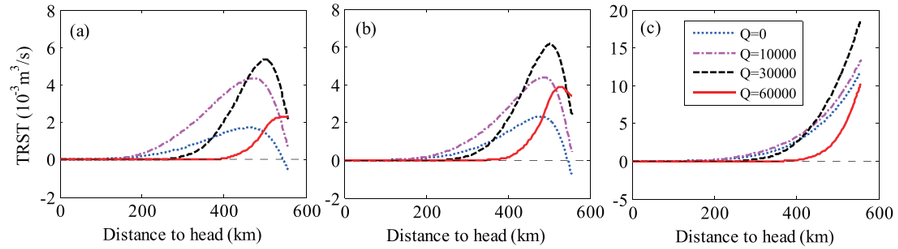


Figure 14. Analyzed TRST related to tidal asymmetries induced by (a) M_2-M_4, (b) M_2-S_2-MS_4, and (c) O_1-K_1-M_2 interactions in the rectangular basin forced by M_2-S_2-O_1-K_1 tides (MSOK scenarios) and by different river discharges on the initial bathymetry. The horizontal thin dotted lines indicate a zero level.

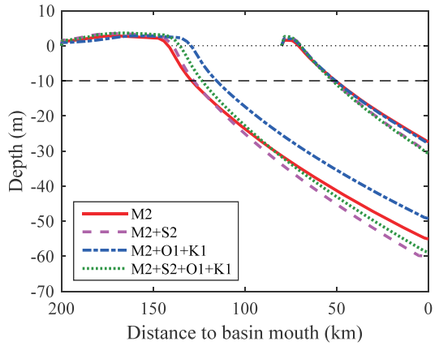


Figure 15. Equilibrium bed profiles in rectangular basin of length of 200 km and 80 km forced by tides only.

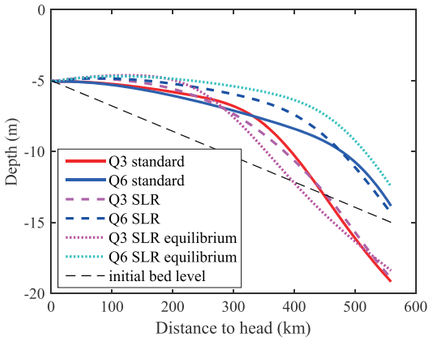


Figure 16. Equilibrium bed profiles of the standard scenarios (Q3 and Q6 excluding sea level rise), that after 400 years considering a linear mean sea level rise by 4m on the basis of the equilibrium bed profiles, and the new equilibriumbed profiles given the high sea level condition.

Sediment transport in a surface-advected estuarine plume

H.Y. Yao, N. Leonardi, J.F. Li, S. Fagherazzi, ***Continental Shelf Research,*** 2016, 116: 122-135.

The interplay between suspended-sediment transport and plume hydrodynamics in a surface-advected estuarine plume is studied using a three-dimensional numerical model. Our analysis focuses on the formation of a sediment-rich alongshore current and on the effect of sediments on the structure of the recirculating freshwater bulge. We introduce the ratio Y between the traveling time of sediment along the bulge edge and the settling timescale. When Y<1, suspended sediments enter the alongshore coastal current. When Y>1 the sediments are deposited within the bulge.We find that a critical range of settling velocities exist above which no transport in the costal current is allowed. Critical settling-velocity values increase with river discharge. Therefore, low magnitude and long-lasting floods promote sediment sorting in the continental shelf. We further find that, for a given flood duration, intermediate flood magnitudes at the limit between subcritical and supercritical flow maximize the alongshore sediment transport. Similarly, for a fixed input of water and sediments, intermediate discharge durations maximize alongshore sediment transport.

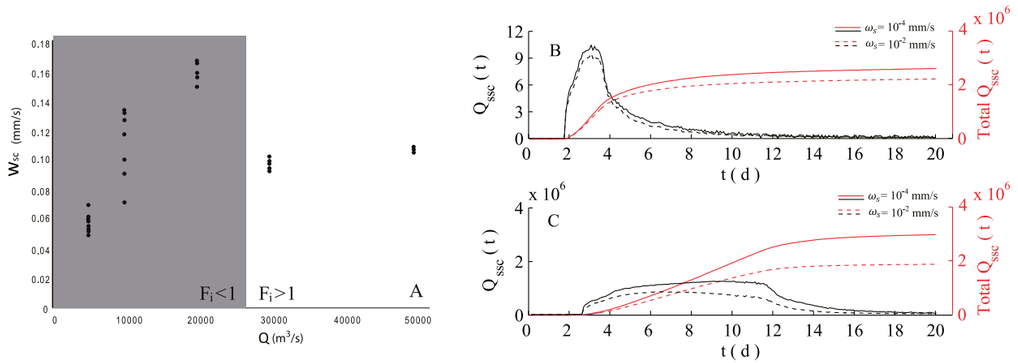


Fig.12. (A) Critical settling velocity computed from the numerical simulations as a function of river discharge. River discharge has been varied from 5000 to 50,000 m^3/s. Input concentration is equal to 1 kg/m^3, sediment settling velocity were varied from 10^{-4} to 1 mm/s. Multiple critical settling velocity values correspond to one river discharge value because different settling velocities change the structure of the freshwater bulge. (B) Sediment flux in the alongshore coastal current (black lines) and cumulative fluxes (red lines) for *Cr*=1 kg/m^3, *Q*=30,000 m^3/s, and for two different settling velocities: ωs=10^{-2} mm/s and ωs=10^{-4} mm/s. (C) Sediment flux in the alongshore coastal current (black lines) and cumulative fluxes (red lines) for *Cr*=1 kg/m^3, *Q*=6000 m^3/s, and for two different settling velocities: ωs=10^{-2} mm/s and ωs=10^{-4} mm/s. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Responses of eastern Chinese coastal salt marshes to sea-level rise combined with vegetative and sedimentary processes

Zhen-Ming Ge, Heng Wang, Hao-Bin Cao, Bin Zhao, Xiao Zhou, Heli Peltola, Li-Fang Cui, Xiu-Zhen Li & Li-Quan Zhang, ***Scientific Reports,*** 2016, 6: 28466.

The impacts of sea-level rise (SLR) on coastal ecosystems have attracted worldwide attention in relation to global change. In this study, the salt marsh model for the Yangtze Estuary (SMM-YE, developed in China) and the Sea Level Affecting Marshes Model (SLAMM, developed in the U.S.) were used to simulate the effects of SLR on the coastal salt marshes in eastern China. The changes in the dominant species in the plant community were also considered. Predictions based on the SLAMM indicated a trend of habitat degradation up to 2100; total salt marsh habitat area continued to decline (4–16%) based on the low-level scenario, with greater losses (6–25%) predicted under the high-level scenario. The SMM-YE showed that the salt marshes could be resilient to threats of SLR through the processes of accretion of mudflats, vegetation expansion and sediment trapping by plants. This model predicted that salt marsh areas increased (3–6%) under the low-level scenario. The decrease in the total habitat area with the SMM-YE under the high-level scenario was much lower than the SLAMM prediction. Nevertheless, SLR might negatively affect the salt marsh species that are not adapted to prolonged inundation. An adaptive strategy for responding to changes in sediment resources is necessary in the Yangtze Estuary.

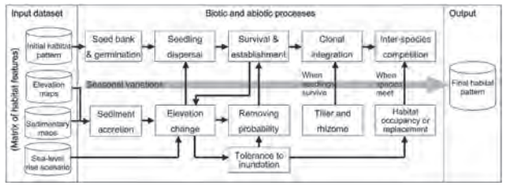


Figure 2. Schematic showing the modeling procedure and the related biotic and abiotic processes.

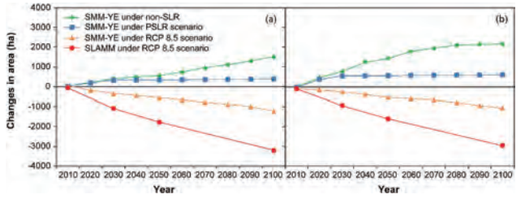


Figure 6. Changes in the total salt marsh habitat area at the Chongming Dongtan wetland (CDW, (a)) and the Jiuduansha wetland (JW, (b)) over the simulation period of 2008–2100 based on the SMM-YE and SLAMM simulations and the scenarios of non-SLR, PSLR and RCP 8.5.

Sediment trapping in the Changjiang Estuary: Observations in the North Passage over a spring-neap tidal cycle

Xiangyu Li, Jianrong Zhu, Rui Yuan, Cheng Qiu, Hui Wu, Estuarine, ***Coastal and Shelf Science***, 2016, 177: 8-19.

Water current, salinity, and suspended sediment concentration (SSC) were measured at three anchored boat sites along the North Passage (NP) of the Changjiang Estuary over a spring-neap tidal cycle, in order to study sediment trapping and siltation in the estuary. Pronounced stratification was observed during the late flood tide and the following early ebb tide, along with an advancing and retreating salt wedge, whereas strong vertical mixing occurred during the late ebb when the effect of the salt wedge faded. Therefore, the SSC in the flood-ebb tidal cycle tended to be asymmetric. In the upper reach of the NP, the seaward advective near-bed sediment transport dominated the total near-bed sediment transport, whereas in the middle reach of the NP, the landward tidal pumping component dominated. Accordingly, a notable convergent near-bed residual sediment transport was generated near the middle reach. Because the convergence of residual sediment transport in the region of a salt wedge is generally recognized as sediment trapping, convergent near-bed residual sediment transport is the cause of the high sedimentation rate in the NP.

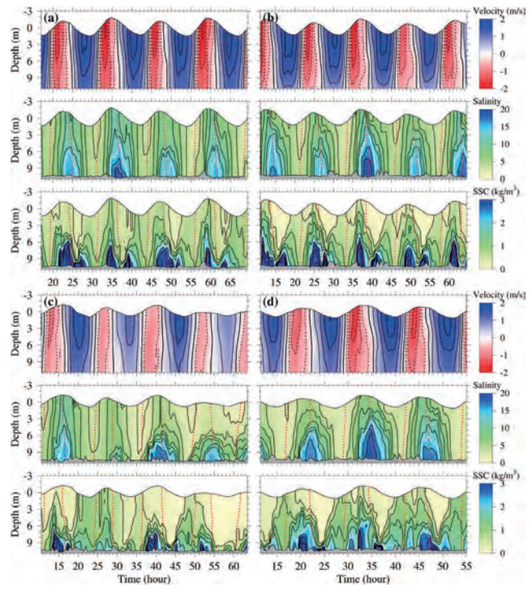


Fig. 3. Temporal variation of the along-channel current speed (positive indicates ebb), salinity and SSC at site A. a: during the spring tide, b: during the MTAS, c: during the neap tide, d: during the MTAN. The dashed lines in the salinity and SSC profiles illustrate the flood and ebb slacks. The contour lines in the current profiles range from 2.0 to 2.0 with an interval of 0.5. The contour lines in the salinity profiles range from 2 to 30 with an interval of 2, and the white contour line specifically indicates a salinity of 14. The contour lines in the SSC profiles range from 0.4 to 4.0 with an interval of 0.4, and the white contour line specifically indicates an SSC of 2.0 (hereinafter is the same).

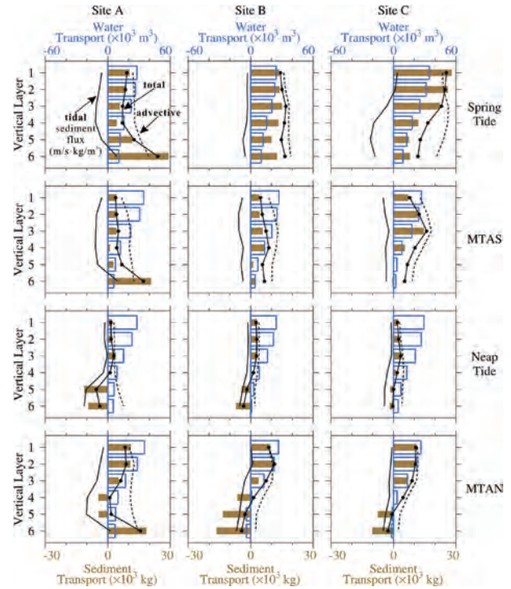


Fig. 9. The vertical variation of the total unit width water transport Tr_w (hollow wide bar, unit: m^3) and sediment transport Tr_{sed} (filled narrow bar, unit: kg) averaged over a complete tidal period at sites A, B, and C during the spring tide, MTAS, neap tide and MTAN (positive indicates seaward). The total residual sediment flux (u·c) and its advective transport component (u)(c), as well as the tidal transport component (u'·c'), are superimposed. Note that the absolute values of the sediment fluxes (black solid and dashed lines) were not important (their scales are therefore omitted), but the relative relations and vertical distributions of the three sediment fluxes were critical.

Drivers, trends, and potential impacts of long-term coastal reclamation in China from 1985 to 2010

Bo Tian, Wenting Wu, Zhaoqing Yang, Yunxuan Zhou, Estuarine, ***Coastal and Shelf Research,*** 2016, 170: 83-90.

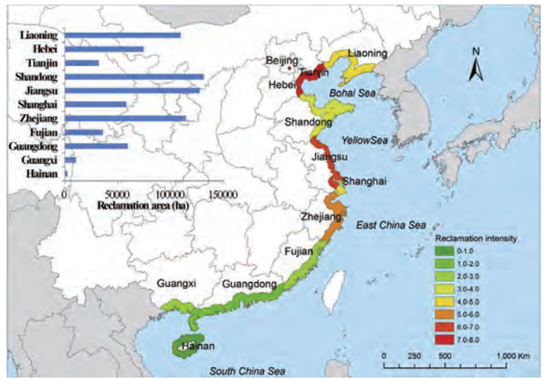


Fig. 1. Coastal reclamation area and intensity in China from 1985 to 2010.

The reclamation of coastal land for agricultural, industrial, and urban land use a common worldwide practiced has occurred extensively in the coastal region of China. In recent decades, all coastal provinces and metropolises in China have experienced severe coastal reclamation related to land scarcity caused by rapid economic growth and urbanization. However, the value of coastal wetlands and ecosystems has not been well understood and appreciated until recent development of advantageous methods of restoring reclaimed land to coastal wetlands in many developed countries. The overall objective of this study is to provide detailed spatial and temporal distributions of coastal reclamation; analyze drivers such as coastal economy, population growth, and urbanization; and understand the relationships among the drivers and land reclamation. We used long-term Landsat image time series from 1985 to 2010 in 5-year intervals, in combination with remotely sensed image interpretation and spatial analysis, to map the reclamation status and changes across the coastal region of China. The Landsat images time-series analysis was also conducted to evaluate the effects of the economy, population, and urbanization drivers on coastal reclamation. The analysis results indicated that 754,697 ha of coastal wetlands have been reclaimed across all coastal provinces and metropolises from 1985 to 2010, and the trend increased sharply after 2005. High-intensity coastal reclamation was mainly driven by the booming economy, especially after 2000, associated with urbanization and industrial development China's coastal region; this was closely correlated the gross domestic product (GDP) per capita. The continuous large-scale coastal reclamation its coastal region now means China is facing a great challenge, including the enormous loss of vegetated coastal wetlands, negative environmental effects, and potential disaster risks related to coastal flooding under future change climate conditions. Long-term ecosystem-coastal protection and management are critical to support sustainable coastal ecosystems in China in the future.

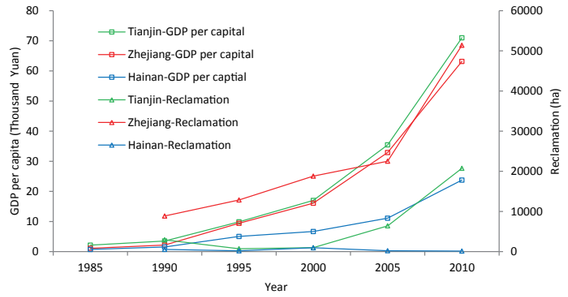


Fig. 3. Relationship between coastal reclamation and GDP per capita at the province level, including Tianjin, Zhejiang, Hainan, which are in the northern, middle, and southern parts of China's coastal region, respectively, and exhibit different intensities of coastal reclamation.

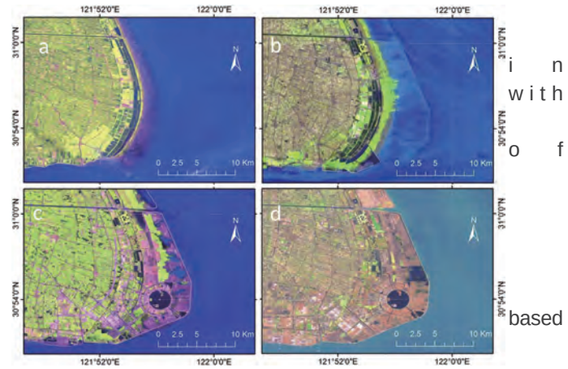


Fig. 5. Coastal reclamation of the Nahui shore for the new coastal city in Shanghai, China from 1990 to 2010 with Landsat 5 TM imagery (RGB ¼ bands 5, 4, 3); a, Year 1990; b, Year 2001 with reclamation; c, Year 2005; and d, Year 2010.

Evaluation of Empirical and Semianalytical Spectral Reflectance Models for Surface Suspended Sediment Concentration in the Highly Variable Estuarine and Coastal Waters of East China

Leonid Sokoletsky, Shen Fang, Xianping Yang, and Xiaodao Wei, ***IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing,*** 2016, 1-11.

Development and validation of the surface suspended sediment concentration (SSC) models derived from the surface remote-sensing reflectance spectra [R_{rs} (λ)] are important in satellite monitoring of estuarine and coastal waters. Seven empirical and seven semianalytical spectral reflectance models for evaluation of the surface SSC were compared with one another and with laboratory tank (one dataset) and *in situ* measurements (two datasets) performed in different natural waters of East China. All models were presented in the form of R_{rs} spectral ratios, in which wavelengths were selected from the list of NASA's satellite sensor, MODIS unsaturated central wavelengths. A statistical analysis has been performed to find the best models and spectral ratios for remote-sensing monitoring purposes. Analysis has shown that empirical models are generally superior to the semianalytical models for solution existence, prediction accuracy, and correlation with the observed SSC values. However, all semianalytical models using the red to green spectral ratio have demonstrated approximately the same accuracy and correlation as empirical models, what provides an additional support for using more simple easily calculated empirical models. Additionally, relationships between SSC and inherent optical properties (IOPs) (absorption and backscattering coefficients) and between IOPs and R_{rs} (λ) provided by the semianalytical models have their own benefits for aquatic optics and remote sensing purposes.

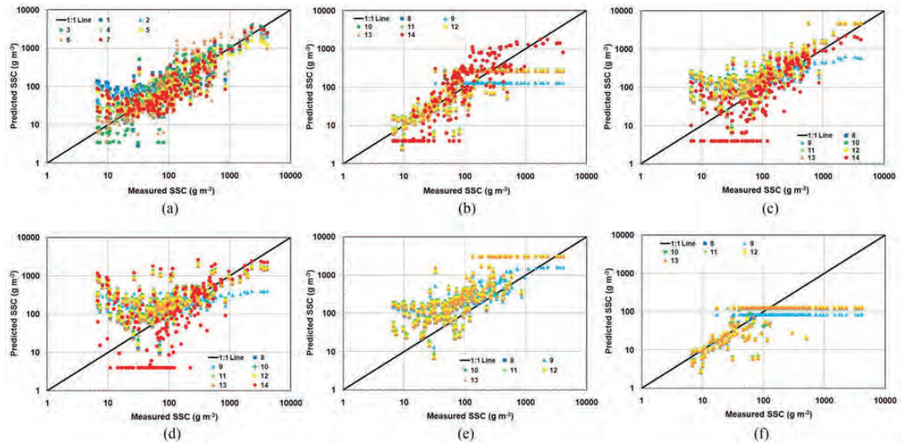


Fig.5. Predicted SSC values in comparison with the measured ones for empirical (a) and semianalytical models using: (b) red to green, (c) NIR to green, (d) NIR to red, (e) NIR to blue, and (f) red to blue *R*rs (λ) spectral ratios.

Semi-automatic recognition of marine debris on beaches
Zhenpeng Ge, Huahong Shi, Xuefei Mei, Zhijun Dai & Daoji Li, ***Scientific Reports,*** 2016, 6: 25759.

The impacts of sea-level rise (SLR) on coastal ecosystems have attracted worldwide attention in relation to global change. In this study, the salt marsh model for the Yangtze Estuary (SMM-YE, developed in China) and the Sea Level Affecting Marshes Model (SLAMM, developed in the U.S.) were used to simulate the effects of SLR on the coastal salt marshes in eastern China. The changes in the dominant species in the plant community were also considered. Predictions based on the SLAMM indicated a trend of habitat degradation up to 2100; total salt marsh habitat area continued to decline (4–16%) based on the low-level scenario, with greater losses (6–25%) predicted under the high-level scenario. The SMM-YE showed that the salt marshes could be resilient to threats of SLR through the processes of accretion of mudflats, vegetation expansion and sediment trapping by plants. This model predicted that salt marsh areas increased (3–6%) under the low-level scenario. The decrease in the total habitat area with the SMM-YE under the high-level scenario was much lower than the SLAMM prediction. Nevertheless, SLR might negatively affect the salt marsh species that are not adapted to prolonged inundation. An adaptive strategy for responding to changes in sediment resources is necessary in the Yangtze Estuary.

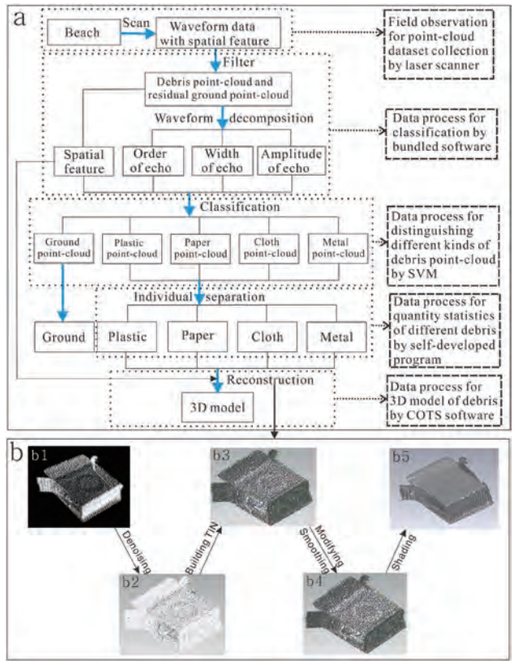


Figure 1. Study workflow. (a) The steps of the whole research. (b) The steps of 3D modeling reconstruction. The figure was created in CorelDRAW Graphics Suite X5.

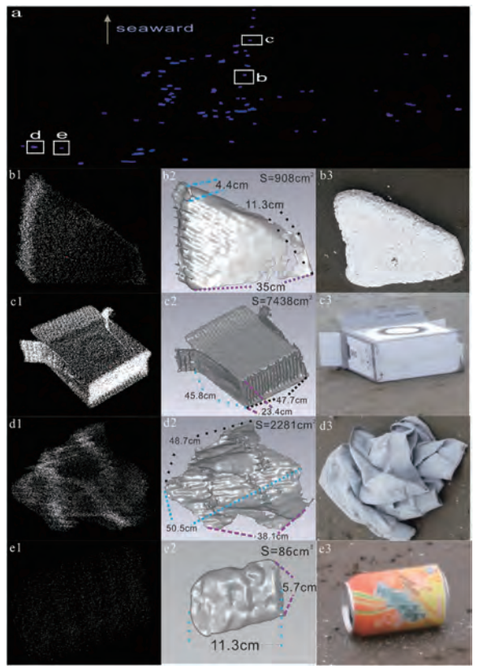


Figure 4. Distribution and reconstruction of debris in the simulated experiment at Nanhui beach. (a) Distribution of identified debris on the beach. The boxes (b–e) represent plastic (b1–b3), paper (c1–c3), cloth (d1–d3) and metal (e1–e3). (b–e1), point-clouds of individual debris; (b–e2), 3D models of individual debris; S is the surface area of the debris, and the distance between two points is the curve length on the surface; (b–e3), photos of real objects. The figure was created in Geomagic Studio 2013 and CorelDRAW Graphics Suite X5.

河口海岸生态与环境
Estuarine and Coastal Ecology and Environment

Phase separation driven by density-dependent movement: A novel mechanism for ecological patterns
Quan-Xing Liu, Max Rietkerk, Peter M.J. Herman, Theunis Piersma, John M. Fryxell, Johan van de Koppel, ***Physics of Life Reviews,*** 2016, 19: 107-121.

Many ecosystems develop strikingly regular spatial patterns because of small-scale interactions between organisms, a process generally referred to as spatial self-organization. Self-organized spatial patterns are important determinants of the functioning of ecosystems, promoting the growth and survival of the involved organisms, and affecting the capacity of the organisms to cope with changing environmental conditions. The predominant explanation for self-organized pattern formation is spatial heterogeneity in establishment, growth and mortality, resulting from the self-organization processes. A number of recent studies, however, have revealed that movement of organisms can be an important driving process creating extensive spatial patterning in many ecosystems. Here, we review studies that detail movement-based pattern formation in contrasting ecological settings. Our review highlights that a common principle, where movement of organisms is density-dependent, explains observed spatial regular patterns in all of these studies. This principle, well known to physics as the Cahn–Hilliard principle of phase separation, has so-far remained unrecognized as a general mechanism for self-organized complexity in ecology. Using the examples presented in this paper, we explain how this movement principle can be discerned in ecological settings, and clarify how to test this mechanism experimentally. Our study highlights that animal movement, both in isolation and in unison with other processes, is an important mechanism for regular pattern formation in ecosystems.

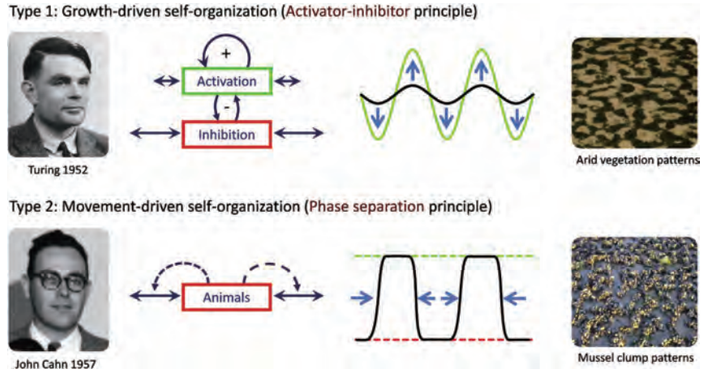


Fig.I. (A) Alan Turing's (1912–1954) principle for spatial pattern formation, based on the interaction of an activator and an inhibitor. Here, the activator promotes it's own growth, but also generates an inhibitor that limits activator growth. The two species diffuse through the system at different rates, with the inhibitor moving faster than the activator. As a result, the activator has a net positive effect on itself at short distance, but inhibits itself at longer distance, via the inhibitor. (B) The Cahn–Hilliard principle (John W. Cahn, 1928–2016; John E. Hilliard, 1926–1987) for phase separation in pattern formation. This principle is based on density-dependent movement, where species tend to disperse at low and very high density, but aggregate at intermediate density. The patterns that then develop interpolate between two stable states, one with high, and another with low biomass (red and green dashed lines). The principle has been developed initially to explain self-organized patterns in metal alloys, and formation of minerals.

Septin genes in channel catfish *(Ictalurus punctatus)* and their involvement in disease defense responses
Qiang Fu, Yun Li, Yujia Yang, Chao Li, Jun Yao, Qifan Zeng, Zhenkui Qin,Shikai Liu, Daoji Li, Zhanjiang Liu, ***Fish & Shellfish Immunology,*** 2016, 49: 110-121.

Septins are an evolutionarily conserved family of GTP-binding proteins. They are involved in diverse processes including cytokinesis, apoptosis, infection, neurodegeneration and neoplasia. In this study, through thorough data mining of existed channel catfish genomic resources, we identified a complete set of 15 septin genes. Septins were classified into four subgroups according to phylogenetic analysis. Extensive comparative genomic analysis, including domain and syntenic analysis, supported their annotation and orthologies. The expression patterns of septins in channel catfish were examined in healthy tissues and after infection with two major bacterial pathogens, Edwardsiella ictaluri and Flavobacterium columnare. In healthy channel catfish, most septin genes were ubiquitously expressed and presented diversity patterns in various tissues, especially mucosal tissues, proposing the significant roles septin genes may play in maintaining homeostasis and host immune response activities. After bacterial infections, most septin genes were regulated, but opposite direction in expression profiles were found with the two bacterial pathogens: the differentially expressed septin genes were down-regulated in the intestine after E. ictaluri infection while generally up-regulated in the gill after F. columnare infection, suggesting a pathogen-specific and tissue-specific pattern of regulation. Taken together, these results suggested that septin genes may play complex and important roles in the host immune responses to bacterial pathogens in channel catfish.

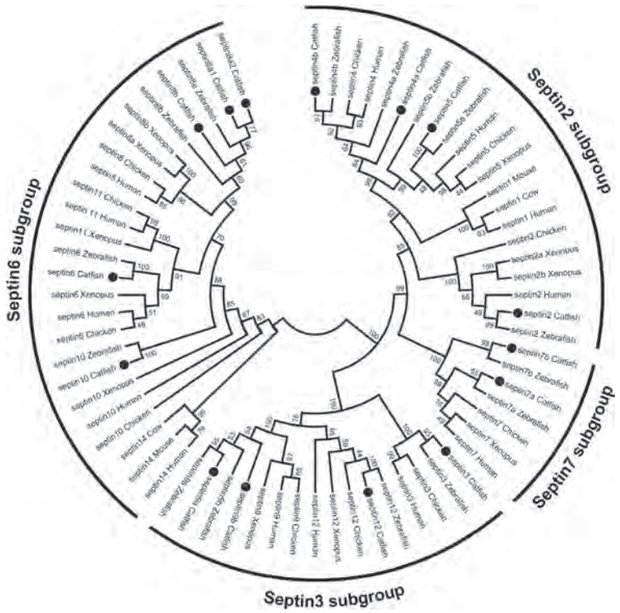


Fig. 1. Overall phylogenetic analysis of 15 septin genes using sequences from catfish, zebrafish, xenopus, chicken and human. The phylogenetic tree was conducted using maximum likelihood algorithm under the JTT + I + G model using MEGA6 software. The black dots indicate catfish septin genes. Bootstrap (1000 replications) support values appear on the branches. The Latin name and accession numbers were provided in Appendix: Supplementary File S1.

Bioavailability of dissolved organic carbon linked with the regional carbon cycle in the East China Sea
Shuchai Gan, Ying Wu, Jing Zhang, ***Deep-Sea Research II,*** 2016, 124: 19-28.

The regional carbon cycle on continental shelves has created great interest recently due to the enigma of whether these areas are a carbon sink or a source. It is vital for a precise carbon cycle model to take the bioavailability of dissolved organic carbon (DOC) into account, as it impacts the sink and source capacity, especially on dynamic shelves such as the East China Sea. Nine bio-decomposition experiments were carried out to assess differences in the bioavailability of DOC. Samples were collected from different water masses in the East China Sea, such as the Coastal Current, the Taiwan Current, and the Kuroshio Current, as well as from the Changjiang (Yangtze River), the main contributor of terrestrial DOC in the East China Sea. This study aimed to quantify and qualify bioavailable DOC (BDOC) in the East China Sea. Both the degradation constant of BDOC and the carbon output from microorganisms have been quantitatively evaluated. Qualitatively, excitation-emission matrix fluorescence spectra (EEMs) were used to evaluate the intrinsic reasons for BDOC variation. By using EEMs in conjunction with parallel factor analysis (PARAFAC), five individual fluorescent components were identified in this study: three humic-like and two protein-like components (P1, P2). The highest P1 and P2 fluorescence intensities were recorded in the coastal water during a phytoplankton algal bloom, while the lowest intensities were recorded in the Changjiang estuary. Quantitatively, BDOC observed during the incubation ranged from 0 to 26.1 μM. The DOC degradation rate constant varied from 0 to 0.027 (d^{-1}), and was lowest in the Changjiang and highest in algal bloom water and warm shelf water (the Taiwan current). The Taiwan Current and mixed shelf water were the major contributors of BDOC flux to the open ocean, and the East China Sea was a net source of BDOC to the ocean. The results verified the importance of BDOC in regional carbon cycle modeling. Combining the data of BDOC and EEMs, there is significant positive linear correlation between BDOC and protein-like peaks (P<0.01). The transformation and degradation of BDOC, which plays an important role in the microbial carbon pump, could be viewed by EEMs. This suggests the potential of EEMs in the quantitative prediction of BDOC in large-scale carbon cycle modeling.

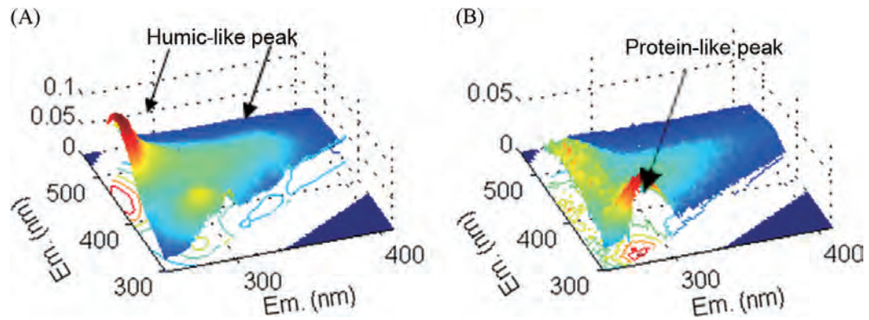


Fig. 6. Examples of EEMs spectra impacted from (a) terrestrial input – the Changjiang and (b) in-situ primary production – algal bloom. Axis Z represents for the fluorescent intensity and is presented by Raman units.

Phytoplankton-driven dark plankton respiration in the hypoxic zone off the Changjiang Estuary, revealed by in vitro incubations

Zhuo-Yi Zhu, Jun Hu, Guo-Dong Song, Ying Wu, Jing Zhang, Su-Mei Liu, ***Journal of Marine Systems,*** 2016, 154: 50-56.

Hypoxia in near-bottom waters has been increasing globally. Dark plankton respiration is a key aspect of hypoxia studies. In situations where the general background eutrophication level is high, more blooms are found in estuaries and adjacent coastal zones, suggesting an increase in respiration from phytoplankton and heterotrophs. An assessment of the phytoplankton biomass-specific rate of dark plankton respiration is therefore of considerable value in terms of environmental assessments and modeling. During the summer of 2011 a series of concentrated in vitro incubation experiments were conducted on board a ship off the Changjiang Estuary and in the adjacent coastal zone, to simulate phytoplankton-driven dark plankton respiration under elevated phytoplankton biomass (i.e. high Chlorophyll α concentration) conditions and to further quantify the relationship between dark plankton respiration and phytoplankton biomass (measured as Chlorophyll α). A power function was used to elucidate the relationship for the concentrated incubation system. Based on our results we determined that the value for this constant was 0.67, which is similar to a previous value derived from other estuaries. Given the strong allochthonous (i.e. terrestrial) material input and the specific incubation condition, an empirical formula is suggested, which applies to conditions in which a high chlorophyll α concentration prevails and in situations where diatoms are the dominant phytoplankton.

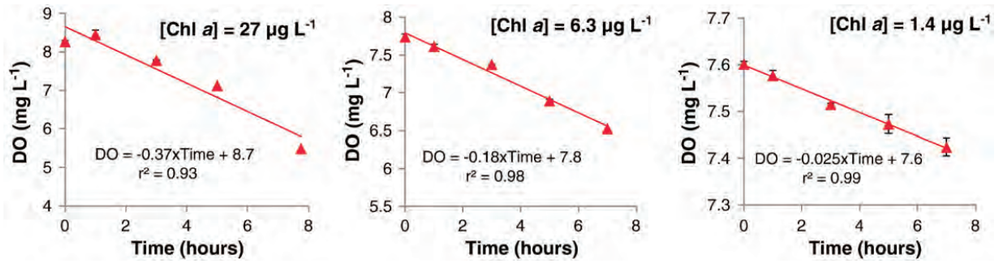


Fig. 2. Typical DOdecrease trend over time under respective Chl α concentration in the concentrated in vitro incubation experiment taking C0 station as an example ([Chl α] is the initial Chl α concentration; note that the error bar is usually smaller than the symbol and Y-axis is different in scale among the three plots).

Dechlorination Mechanism of 2,4-Dichlorophenol by Magnetic MWCNTs Supported Pd/Fe Nanohybrids: Rapid Adsorption, Gradual Dechlorination, and Desorption of Phenol

Jiang Xu, Xue Liu, Gregory Victor Lowry, Zhen Cao, Heng Zhao, John L. Zhou, and Xinhua Xu, ***Applied Materials & Interfaces,*** 2016, 8: 7333-7342.

2,4-dichlorophenol was effectively removed from water using magnetic Pd/Fe nanoparticles supported on multiwalled carbon nanotubes (MWCNTs). The adsorption kinetics, isotherms, and energy for 2,4-dichlorophenol and its partially (4-chlorophenol, 2-chlorophenol) and completely (phenol) dechlorinated products are presented and discussed. The adsorption capacity was 2,4-dichlorophenol > 4-chlorophenol > 2-chlorophenol > phenol for MWCNTs. MWCNTs- Fe_3O_4−Pd/Fe nanohybrids provided rapid adsorption, gradual dechlorination, and final desorption of phenol, which is attractive as a remediation technology. Over 82.7% of the phenol was desorbed and released to the aqueous phase after 72 h due to its low adsorption capacity, leaving the majority of active sites available on the surface of MWCNTs-Fe_3O_4−Pd/Fe. The nanohybrids maintained high activity in five consecutive in situ experiments, and they were retrievable using magnetic separation. MWCNTs- Fe_3O_4−Pd/Fe nanohybrids outperform unsupported Pd/Fe nanoparticles, which were difficult to retrieve, and were easily passivated and aggregated.

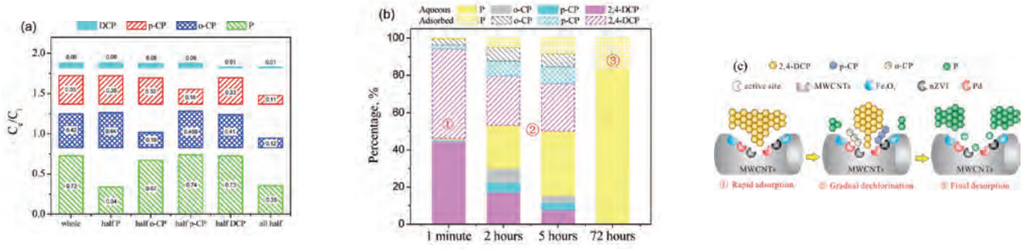


Figure 7. Whole process of 2,4-DCP adsorption and dechlorination by MWCNTs-Fe_3O_4−Pd/Fe nanohybrids: (a) mutual adsorption without Pd loading; (b) simultaneous adsorption and dechlorination with 0.2 wt % Pd loading; (c) schematic of the dechlorination mechanism (T = 303 K, initial pH = 6.5, 0.12 mM 2,4-DCP, 3.0 g L^{-1} MWCNTs, 2.0 g L^{-1} Fe_3O_4, 3.0 g L^{-1} Fe).

Preparation of functionalized Pd/Fe-Fe_3O_4@MWCNTs nanomaterialsfor aqueous 2,4-dichlorophenol removal: Interactions, influencefactors, and kinetics

Jiang Xu, Zhen Cao, Xue Liu, Heng Zhao, Xi Xiao, Jiaping Wu, Xinhua Xu, John L. Zhou, ***Journal of Hazardous Materials,*** 2016, 317: 656-666.

Magnetic multi-walled carbon nanotubes (MWCNTs) were prepared to support Pd/Fe nanoparticles, inhibit the aggregation and passivation, and achieve magnetic separation to avoid the environmental risk of nanoparticles. Rapid adsorption of initial contaminant, steady dechlorination, and gradual desorption of final product was observed. The micromorphology, chemical structure, and componentsof the nanohybrids were comprehensively characterized by a series of analysis technologies, such as EDX, XRD, SEM, TEM, and XPS. The interactions between the nanohybrids compositions were discussed according to the characterization and experimental data. The whole insight of 2,4-dichlorophenol(2,4-DCP) adsorption-dechlorination-desorption was studied in detail, including the pathways, influence factors, dechlorination kinetics and selectivity. Weak acidity (pH = 5.0 and 6.5) favored the 2,4-DCP removal. Satisfactory reactivity of the Pd/Fe-Fe_3O_4@MWCNTs nanohybrids was observed infive consecutive runs, and 99.2%, 89.6%, 92.1%, 99.8%, and 99.9% of 2,4-DCP was removed, respectively. Most of the final product (phenol) was steadily desorbed to the liquid phase, resulted in the re-exposureof active sites on the nanohybrids and maintained a longer activity.

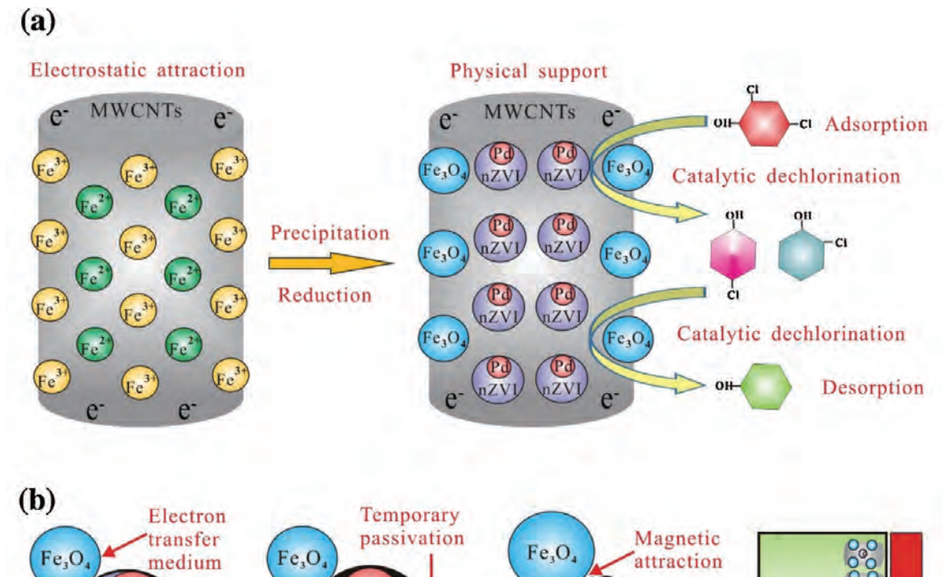
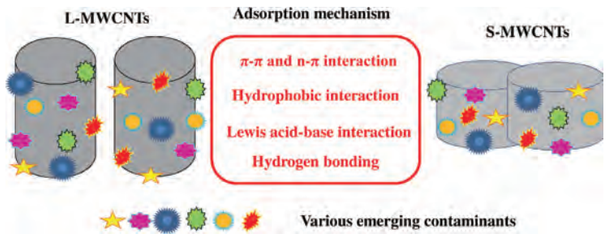


Fig. 8. Mechanism of 2,4-DCP removal by Pd/Fe-Fe_3O_4@MWCNTs nanohybrids (a) preparation and reaction, (b) magnetic property.

Adsorption behavior and mechanism of chloramphenicols,sulfonamides, and non-antibiotic pharmaceuticals on multi-walledcarbon nanotubes

Heng Zhao, Xue Liu, Zhen Cao, Yi Zhan, Xiaodong Shi, Yi Yang, Junliang Zhou,Jiang Xu, ***Journal of Hazardous Materials,*** 2016, 31:235-245.



The adsorption behavior of different emerging contaminants (3 chloramphenicols, 7 sulfonamides, and 3 non-antibiotic pharmaceuticals) on five types of multi-walled carbon nanotubes (MWCNTs), and the underlying factors were studied. Adsorption equilibriums were reached within 12 h for allcompounds, and well fitted by the Freundlich isotherm model. The adsorption affinity of pharma-ceuticals was positively related to the specific surface area of MWCNTs. The solution pH was an important parameter of pharmaceutical adsorption on MWCNTs, due to its impacts on the chemical speciation of pharmaceuticals and the surface electrical property of MWCNTs. The adsorption ofionizable pharmaceuticals decreased in varying degrees with the increased ionic strength. MWCNT-10 was found to be the strongest adsorbent in this study, and the Freundlich constant (KF) valueswere 353–2814 $mmol^{1-n}L^n/kg$, 571–618 $mmol^{1-n}L^n/kg$, and 317–1522 $mmol^{1-n}L^n/kg$ for sulfonamides, chloramphenicols, and non-antibiotic pharmaceuticals, respectively. The different adsorption affinity of sulfonamides might contribute to the different hydrophobic of heterocyclic substituents, while chloramphenicols adsorption was affected by the charge distribution in aromatic rings via substituent effects.

nirS-Encoding denitrifier community composition, distribution, and abundance along the coastal wetlands of China

Juan Gao, Lijun Hou, Yanling Zheng, Min Liu, Guoyu Yin, Xiaofei Li, Xianbiao Lin, Chendi Yu, Rong Wang, Xiaofen Jiang, Xiuru Sun, ***Applied microbiology and biotechnology,*** 2016, 100: 8573-8582.

For the past few decades, human activities have intensively increased the reactive nitrogen enrichment in China's coastal wetlands. Although denitrification is a critical pathway of nitrogen removal, the understanding of denitrifier community dynamics driving denitrification remains limited in the coastal wetlands. In this study, the diversity, abundance, and community composition of *nirS*-encoding denitrifiers were analyzed to reveal their variations in China's coastal wetlands. Diverse *nirS* sequences were obtained and more than 98%of them shared considerable phylogenetic similarity with sequences obtained from aquatic systems (marine/estuarine/ coastal sediments and hypoxia sea water). Clone library analysis revealed that the distribution and composition of *nirS*-harboring denitrifiers had a significant latitudinal differentiation, but without a seasonal shift. Canonical correspondence analysis showed that the community structure of *nirS* encoding denitrifiers was significantly related to temperature and ammonium concentration. The *nirS* gene abundance ranged from 4.3×10^5 to 3.7×10^7 copies g^{-1} dry sediment, with a significant spatial heterogeneity. Among all detected environmental factors, temperature was a key factor affecting not only the *nirS* gene abundance but also the community structure of *nirS*-type denitrifiers. Overall, this study significantly enhances our understanding of the structure and dynamics of denitrifying communities in the coastal wetlands of China.

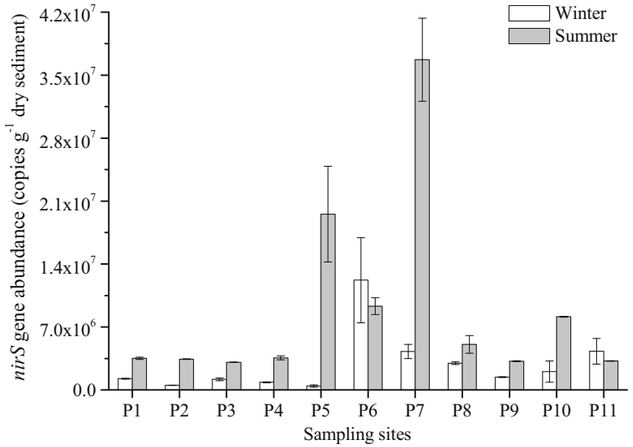
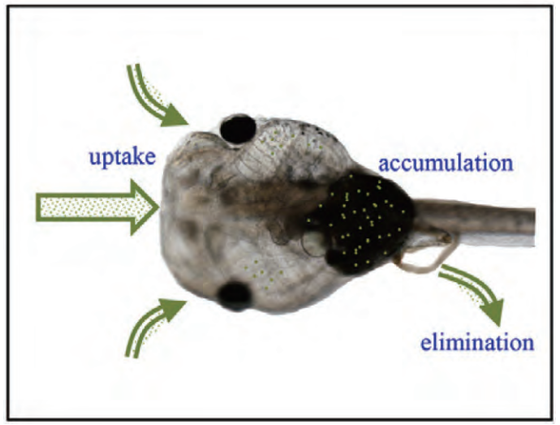


Fig. 6 The abundance of *nirS*-based denitrifiers in the coastal wetlands of China. Vertical bars show standard error (n = 3)

Uptake, accumulation and elimination of polystyrene microspheres in tadpoles of Xenopus tropicalis

Lingling Hu, Lei Su, Yingang Xue, Jingli Mu, Jingmin Zhu, Jiang Xu, Huahong Shi, ***Chemosphere,*** 2016,164:611-617.



Microplastic is an emerging contaminant affecting freshwater and marine ecosystem across the globe. In the present study, the filter feeding tadpoles of Xenopus tropicalis were exposed to polystyrene microspheres (1 and 10 μm) for 48 h. Microspheres were observed in gills and digestive tract of tadpoles within 1 h after exposure as well as in feces 6 h after exposure. The accumulation of microspheres in the tadpoles were concentration dependent (Univariate ANOVA, $p < 0.001$), but no time dependent accumulation of microspheres was observed in tadpoles 48 h after exposure (Univariate ANOVA, $p > 0.05$). After the exposed tadpoles were transferred to clean water, the number of microspheres in the tadpoles decreased dramatically after 1 d and continued to decrease gradually afterwards. The absorbed polystyrene particles in unfed tadpoles was significantly higher than those in the fed tadpoles at 12 and 24 h after exposure. After transfer to clean water, the fed tadpoles showed a significant decrease in the amount of absorbed polystyrene particles, while the unfed tadpoles showed no significant change in the amount of absorbed polystyrene particles. Our results suggested that microspheres were likely to be ingested and egested relatively fast by tadpoles. Our results indicated that aquatic vertebrate organisms might ingest more microplastics if the abundance of microplastics continues to increase while the available food becomes less.

Tidal pumping facilitates dissimilatory nitrate reduction in intertidal marshes

Yanling Zheng, Lijun Hou, Min Liu2, Zhanfei Liu, Xiaofei Li, Xianbiao Lin, Guoyu Yin, Juan Gao, Chendi Yu, Rong Wang & Xiaofen Jiang, ***Scientific Reports,*** 2016, 6: 21338.

Intertidal marshes are alternately exposed and submerged due to periodic ebb and flood tides. The tidal cycle is important in controlling the biogeochemical processes of these ecosystems. Intertidal sediments are important hotspots of dissimilatory nitrate reduction and interacting nitrogen cycling microorganisms, but the effect of tides on dissimilatory nitrate reduction, including denitrification, anaerobic ammonium oxidation and dissimilatory nitrate reduction to ammonium, remains unexplored in these habitats. Here, we use isotope-tracing and molecular approaches simultaneously to show that both nitrate-reduction activities and associated functional bacterial abundances are enhanced at the sediment-tidal water interface and at the tide-induced groundwater fluctuating layer. This pattern suggests that tidal pumping may sustain dissimilatory nitrate reduction in intertidal zones. The tidal effect is supported further by nutrient profiles, fluctuations in nitrogen components over flood-ebb tidal cycles, and tidal simulation experiments. This study demonstrates the importance of tides in regulating the dynamics of dissimilatory nitrate-reducing pathways and thus provides new insights into the biogeochemical cycles of nitrogen and other elements in intertidal marshes.

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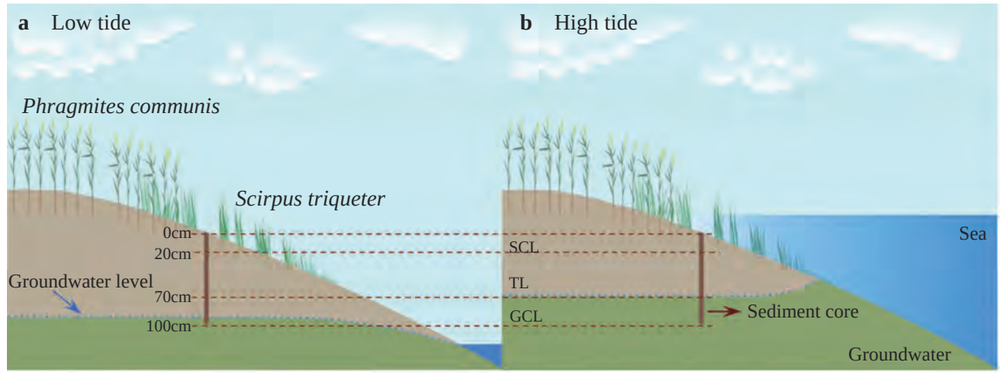

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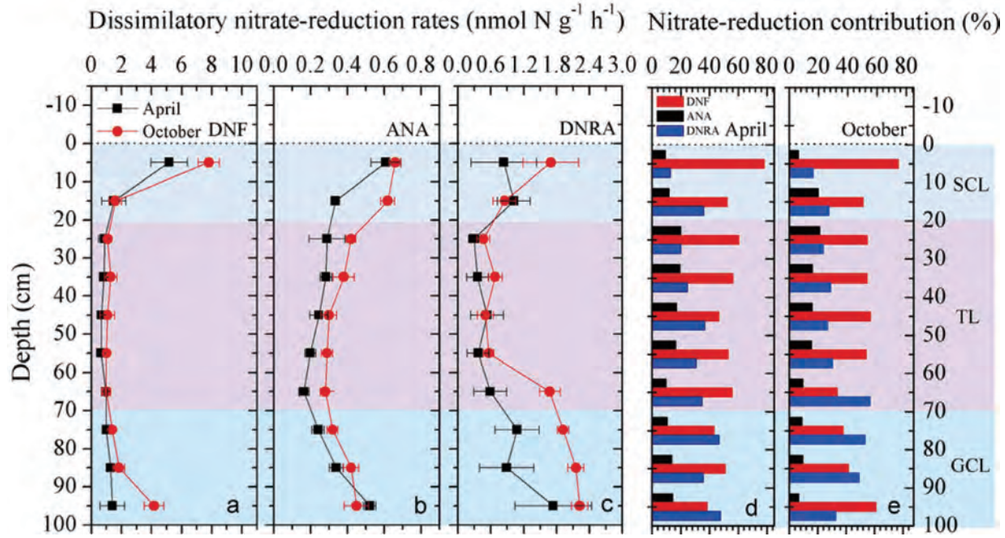


Figure 1. **Vertical profiles of dissimilatory nitrate-reduction activities in intertidal marshes.** (I) Schematic of the sampling cores at low tide (a) and high tide (b) in intertidal marshes. (II) The vertical distribution patterns of potential denitrification (DNF) rates (a), anammox (ANA) rates (b), DNRA rates (c), and their relative contributions to total nitrate reduction in April (d) and October (e), respectively. SWI: Sediment-water interface; SCL: SWI controlled layer in which sediment is primarily affected by overlying tidal water over tidal cycles; TL: Transition layer; GCL: Groundwater controlled layer in which sediment is primarily affected by groundwater fluctuation over tidal cycles. Sediment-layer identification (SCL, TL, and GCL) is based on the depth distributions of sediment water content (Supplementary Fig. 2). Error bars indicates s.d. (n = 3).

Seasonal distribution patterns of 7Be and 210Pb in surface sediments in the Changjiang Estuary, China and their implication

Juan Du, Jinzhou Du, Dekun Huang, Jinlong Wang, Jing Zhang, ***Journal of Marine Systems,*** 2016, 154: 41-49.

The estuarine-inner shelf region of the East China Sea (ECS) is heavily impacted from the riverine input from the Changjiang River. In this study, the grain size and activities of radionuclides (^{7}Be and ^{210}Pb) of surface sediments collected from the Changjiang Estuary to the southern inner shelf of the ECS in June and November 2010, were measured to provide the study of the sources and the transportation pathways of surface sediments in this region. The results indicated that the grain size of surface sediments ranged from 8.1 to 251.1 μm and from 5.8 to 128.3 μm with an average of 85.1 μm and 56.6 μm in June and November 2010, respectively. Relatively large particle sizes were observed in the northwest and southeast of our study area. Meanwhile, the grain size increased offshore. The activities of ^{7}Be in the surface sediments were high in the nearshore stations and the activities of $^{210}Pb_{ex}$ in the surface sediments increased from north to south. For ^{7}Be,more than 90% was decayed before deposition into the surface sediment. However, most ^{210}Pb (99%) was deposited into the sediment. Both^{7}Be and ^{210}Pb need to be input into the inner shelf by boundary scavenging processes to balance the budget.

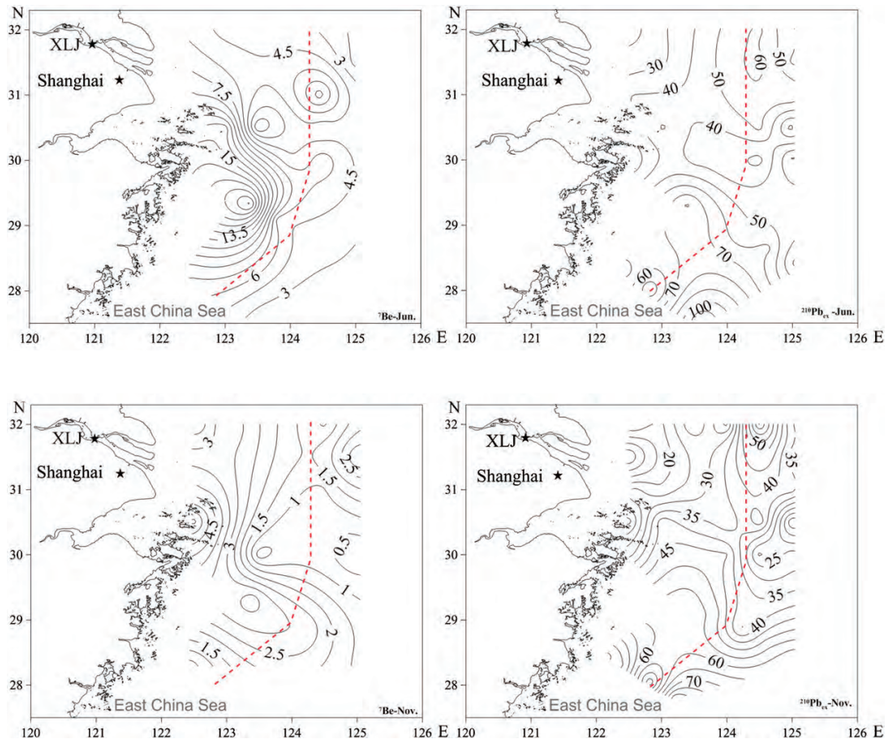


Fig. 3. Distribution patterns of activities of ^{7}Be and $^{210}Pb_{ex}$ (Bq kg^{-1}) in the surface sediments in the East China Sea.

Microscopic anthropogenic litter in terrestrial birds from Shanghai, China: Not only plastics but also natural fibers

Shiye Zhao, Lixin Zhu, Daoji Li, ***Science of the Total Environment,*** 2016, 550: 1110-1115.

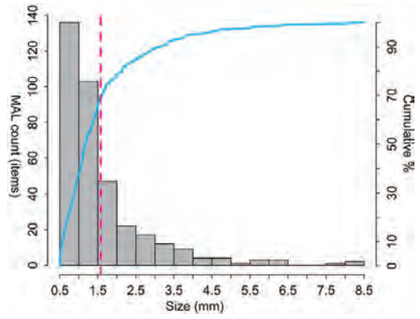


Fig. 2.MAL sample size histogram. The line represents cumulative percentage. Dashed line represents measured mean size.

The level of contamination by microscopic anthropogenic litter (0.5–5 mm) in terrestrial ecosystems is not well understood. After chemical digestion in 10% KOH, microscopic anthropogenic litter from the gastrointestinal tracts of 17 terrestrial birds was identified and categorized under a stereomicroscope based on its physical properties and melting tests. In total, 364 items from 16 birds were identified as microscopic anthropogenic litter, ranging in size from 0.5 to 8.5mm. No relationship between plastic load and body condition was found. Natural fibers, plastic fibers and fragmented plastics represented, respectively, 37.4% (136 items), 54.9% (200 items) and 7.7% (28 items) of total litter items. Small sample sizes limited our ability to draw strong conclusions about the metabolism of natural fibers, but the decline in the proportion of natural fibers from the esophagus to stomach to intestine suggested that they may be digestible. Particles smaller than 5 mm represented more than 90% of the total number of pollutant items. Particles with colors in the mid-tones and fibrous shapes were overwhelmingly common particles. The results reflect pollution by microscopic anthropogenic litter in the terrestrial ecosystem of the study area. Microscopic natural fibers, which may disperse and adsorb chemical pollutants differently from microplastic and may pose an even greater risk, are in urgent need of further research.

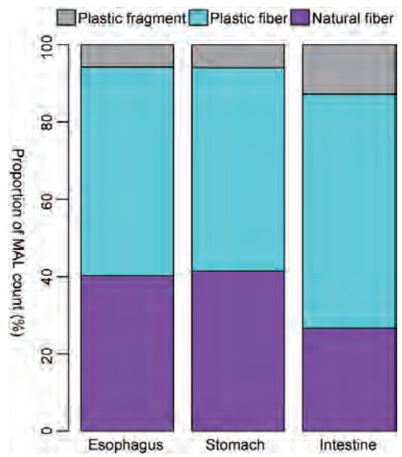


Fig. 4. Plastic fragment, plastic fiber and natural fiber composition in the esophagus, stomach and intestine of specimens (in % of the total count of MAL detected in each part).

Organic carbon flux and particulate organic matter composition in Arctic valley glaciers: examples from the Bayelva River and adjacent Kongsfjorden

Zhuo-Yi Zhu, YingWu, Su-Mei Liu, Fred Wenger, Jun Hu, Jing Zhang, and Rui-Feng Zhang, ***Biogeosciences,*** 2016, 13: 975-987.

In the face of ongoing global warming and glacier retreat, the composition and flux of organic matter in glacier–fjord systems are key variables for updating the carbon cycle and budget, whereas the role of Arctic valley glaciers seems unimportant when compared with the huge Greenland Ice Sheet. Our field observations of the glacier-fed Bayelva River, Svalbard, and the adjacent Kongsfjorden allowed us to determine the compositions of particulate organic matter from glacier to fjord and also to estimate the flux of organic carbon, both for the river and for Svalbard in general. Particulate organic carbon (POC) and dissolved organic carbon (DOC) in the Bayelva River averaged 56 and 73 μM, respectively, in August, 2012. Amino acids (AAs) and phytoplankton carbon accounted for ~10%of the bulk POC in the Bayelva River, while AAs represented > 90% of particulate nitrogen (PN) in fjord surface water, suggesting the strong in situ assimilation of organic matter. Bacteria accounted for 13 and 19% of the POC in the Bayelva River and the Kongsfjorden, respectively, while values for PN were much higher (i.e., 36% in Kongsfjorden).

The total discharge from the Bayelva River in 2012 was 29x10^6 m^3. Furthermore, we calculated the annual POC, DOC, and PN fluxes for the river as 20±1.6 tons, 25±5.6 tons, and 4.7±0.75 tons, respectively. Using the POC content and DOC concentration data, we then estimated the annual POC and DOC fluxes for Svalbard glaciers. Although the estimated POC (0.056±0.02x10^6 tons year^{-1}) and DOC (0.02±0.01x10^6 tons year^{-1}) fluxes of Svalbard glaciers are small in amount, its discharge-weighted flux of DOC was over twice higher than other pan-Arctic glacier systems, suggesting its important role as a terrestrial DOC source.

Table 5. Estimated organic carbon flux from Svalbard and its comparison with other pan-Arctic glacier systems.

	Total POC flux	Total DOC flux	Area-weighted POC flux	Area-weighted DOC flux	Discharge-weighted POC flux	Discharge-weighted DOC flux
	10^6 tons year^{-1}	10^6 tons year^{-1}	tons km^{-2} year^{-1}	tons km^{-2} year^{-1}	mg L^{-1}	mg L^{-1}
Svalbard Archipelago	0.056 ± 0.02	0.02 ± 0.01	1.5 ± 0.5	0.55 ± 0.3	2.2	0.86
Greenland Ice Sheet[1]	0.9–0.94	0.08–0.15	0.7–0.8	0.07–0.12	3.7	0.32
Gulf of Alaska[2]		0.10 ± 0.01		1.3 ± 0.11		0.31

[1] Derived from Bhatia et al. (2013) and Lawson et al. (2014). [2] Derived from Hood et al. (2009).

Microplastics in mussels along the coastal waters of China

Jiana Li, Xiaoyun Qu, Lei Su, Weiwei Zhang, Dongqi Yang, Prabhu Kolandhasamy, Daoji Li, Huahong Shi, ***Environmental Pollution,*** 2016, 241: 177-184.

Microplastic has been confirmed as an emerging pollutant in marine environments. One of the primary environmental risks of microplastics is their bioavailability for aquatic organisms. Bivalves are of particular interest because their extensive filter-feeding activity exposes them directly to microplastics present in the water column. In the present study, we investigated microplastic pollution in mussels (*Mytilus edulis*) from 22 sites along 12,400 mile coastlines of China in 2015. The number of total microplastics varied from 0.9 to 4.6 items/g and from 1.5 to 7.6 items/individual. *M. edulis* contained more microplastics (2.7 items/g) in wild groups than that (1.6 items/g) in farmed groups. The abundance of microplastics was 3.3 items/g in mussels from the areas with intensive human activities and significantly higher than that (1.6 items/g) with less human activities. The most common microplastics were fibers, followed by fragments. The proportion of microplastics less than 250 μm in size arranged from 17% to 79% of the total microplastics. Diatom was distinguished from microplastics in mussels for the first time using Scanning Electron Microscope. Our results suggested that the numbers of microplastic kept within a relatively narrow range in mussels and were closely related to the contamination of the environments. We proposed that mussels could be used as a potential bioindicator of microplastic pollution of the coastal environment.

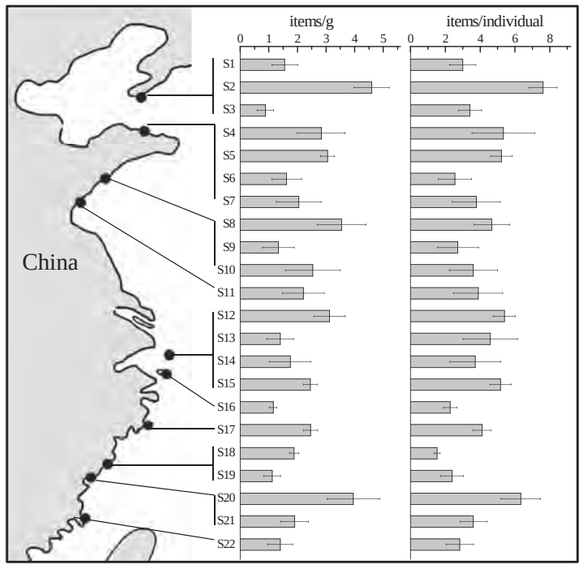


Fig. 2. Abundance of microplastics in mussels along the coastal waters of China. Six replicates were set for mussels at each site (n=6), and 2-5 individuals were pooled as one replicate.

Microplastics in Taihu Lake, China

Lei Su, Yingang Xue, Lingyun Li, Dongqi Yang, Prabhu Kolandhasamy, Daoji Li, Huahong Shi, ***Environmental Pollution,*** 2016, 216: 711-719.

In comparison with marine environments, the occurrence of microplastics in freshwater environments is less understood. In the present study, we investigated microplastic pollution levels during 2015 in Taihu Lake, the third largest Chinese lake located in one of the most developed areas of China. The abundance of microplastics reached 0.01x10^6-6.8x10^6 items/km^2 in plankton net samples, 3.4-25.8 items/L in surface water, 11.0-234.6 items/kg dw in sediments and 0.2-12.5 items/g ww in Asian clams (*Corbicula fluminea*). The average abundance of microplastics was the highest in plankton net samples from the southeast area of the lake and in the sediments from the northwest area of the lake. The northwest area of the lake was the most heavily contaminated area of the lake, as indicated by chlorophyll-α and total phosphorus. The microplastics were dominated by fiber, 100-1000 μm in size and cellophane in composition. To our best knowledge, the microplastic levels measured in plankton net samples collected from Taihu Lake were the highest found in freshwater lakes worldwide. The ratio of the microplastics in clams to each sediment sample ranged from 38 to 3810 and was negatively correlated to the microplastic level in sediments. In brief, our results strongly suggest that high levels of microplastics occurred not only in water but also in organisms in Taihu Lake.

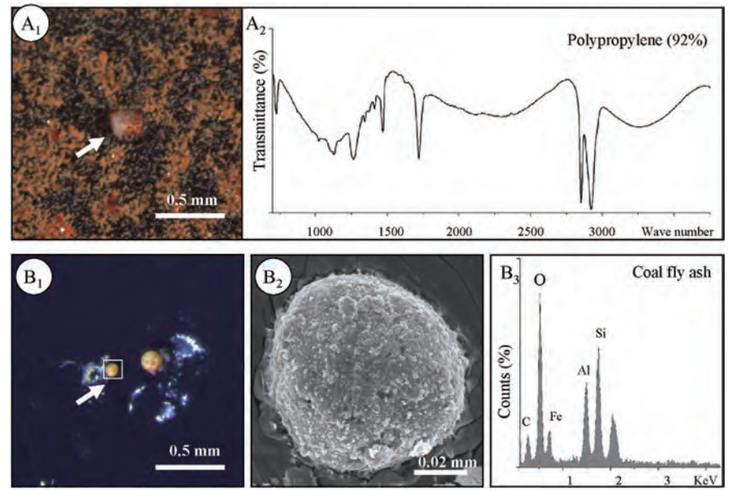


Fig. 5. Photographs of plastic (A_1) and non-plastic (B_1) items identified using m-FTIR (A_2) and SEM/EDS (B_2 and B_3). A_1 and B_1 were taken under microscopes, and B_2 was taken under SEM for the white box areas in B_1. A_2 is the spectrum for the particle in A_1, and B_3 is the spectrum for the particle in B_2.

An 800-year record of terrestrial organic matter from the East China Sea shelf break: Links to climate change and human activity in the Changjiang Basin

Zhong Qiao Li, Ying Wu, Su Mei Liu, Jin Zhou Du, Jing Zhang, ***Deep-Sea Research II,*** 2016, 124: 64-73.

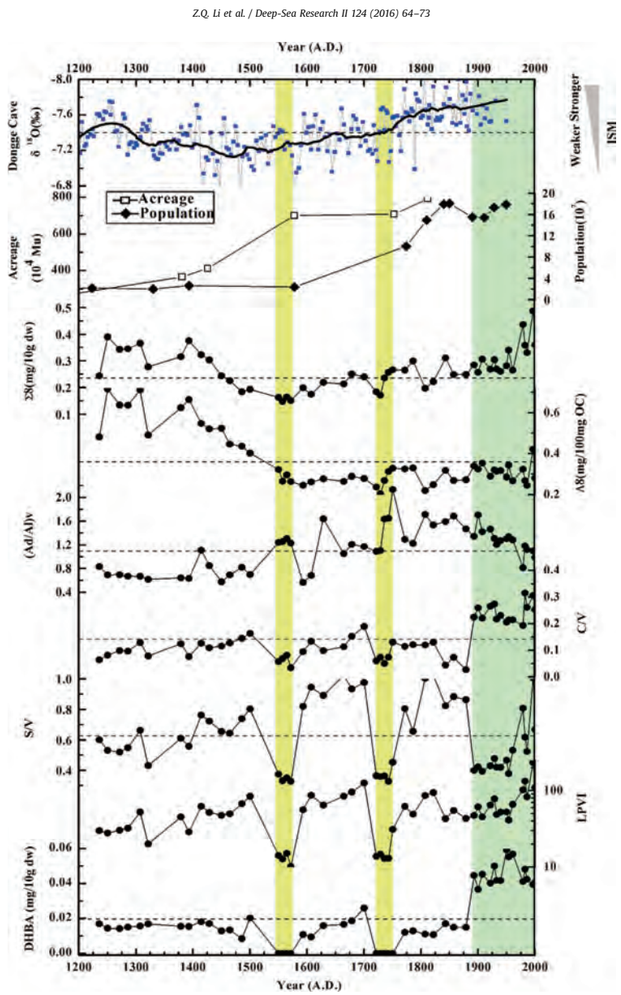


Fig. 5. Changes in lignin phenol index, DHBA of the P4 core sediment as well as the speleothem $\delta^{18}O$ records from the Dongge Cave (Wang et al., 2005), population increase in the Changjiang drainage basin and acreage under cultivation in China (Zhang, 2000) in recent 800 years. The light yellow bars marked the extreme drought events around 1580 A.D. and 1720 A.D.; the green bars indicated the period influenced by human activities in the high altitude region of the Changjiang Basin.

The East China Sea (ECS) is a large river dominated marginal sea and receives massive volumes of terrestrial material from the Changjiang (Yangtze River). As the ECS preserves a record of terrestrial material derived from the Changjiang Basin, cores collected from this region can be used to reconstruct paleoclimate change and human disturbance in the watershed. A core (P4) was collected from the ECS shelf break and analyzed for bulk parameters (organic carbon (OC), total nitrogen (TN), and stable carbon isotopes ($\delta^{13}C$)), lignin phenols, and 3,5-dihydroxy benzoic acid (DHBA). The depth profiles of these parameters indicate stable and consistent marine production. The lignin source indices, cinnamyl phenols vs. vanillyl phenols (C/V) and syringyl phenols vs. vanillyl phenols (S/V), were in agreement with previously reported results from ECS surface sediments, but differed markedly from Bohai Sea surface sediments. The ratio of acid to aldehyde in vanillyl phenols ((Ad/Al)v) indicated the terrestrial OC in this core was refractory. At the same time, the variation in lignin phenols is positively correlated with the strength of the Indian Summer Monsoon (ISM) over the last 800 years (p<0.001). This is because most sediment is delivered from the upper reaches of the Changjiang Basin, where the ISM is the key control on precipitation. Two extreme drought events, around 1580 A.D. and 1770 A.D. were also identified in the core based on the extremely low C/V, S/V, lignin phenol vegetation index (LPVI), and DHBA values. Furthermore, the significant shift in C/V and S/V since 1880 A.D. is probably a reflection of increased human activity in the upper Changjiang Basin over this period.

Sedimentary BSi and TOC quantifies the degradation of the Changjiang Estuary, China, from river basin alteration and warming SST

Maotian Li, Hong Wang, Yimiao Li, Wei Ai, Lijun Hou, Zhongyuan Chen, ***Estuarine, Coastal and Shelf Research,*** 2016, 183: 392-401.

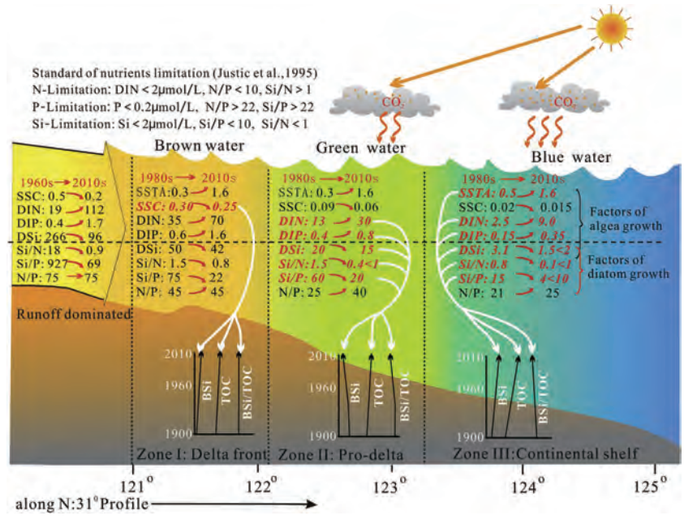


Fig. 8. Process-response model of ecosystem evolution of the Changjiang Estuary.

Environmental degradation in the Changjiang Estuary has recently become a global topic, given its proximity to Shanghai with a population >23 million. Intensification of human activities affecting the river basin is responsible for this degradation. Dam construction has cut off ca. 2/3 of the sediment flux to the sea, ca. 60% of the dissolved silicate load (DSi) has been retained in the reservoirs, while total phosphorous (TP) and total nitrogen (TN) transport to the sea are many times more than they were a few decades ago. Under such circumstances, details of the estuarine degradation remain poorly understood. This study uses sedimentary biological silicate (BSi) and total organic carbon (TOC) as environmental proxies to reveal the process-response of such degradation since the 1950s. Our results demonstrate the spatial differences of such degradation. The inner zone of the estuary used to be highly turbid, but presently has increasing diatom (BSi) and primary production (TOC), due to lower suspended sediment concentration (SSC) in relation to dam construction. In contrast, increasing riverine dissolved inorganic nitrate (DIN) and dissolved inorganic phosphorous (DIP) input (up to 2-5 times) and decreasing DSi provide a unique setting, with an excess in N and P, which catalyzes non-diatom algae in the less-turbid middle zone of the estuary. These are reflected by decreasing BSi and BSi/TOC since the 1950s, together with an increase of TOC of 20-40%. In the outer zone of the estuary, increasing DIN, DIP, and sea surface temperatures (SSTs), have resulted in the increase of diatom biomass by 15-20% and the growth of primary production by 30-60% since the 1950s. But the drastic decrease in DSi, Si/N, and Si/P depresses the ability of diatoms to develop, resulting in a reduction of 5-10% diatom proportion (BSi/TOC) since the 1930s. This study improves the understanding of the changing estuarine ecosystem in response to global change.

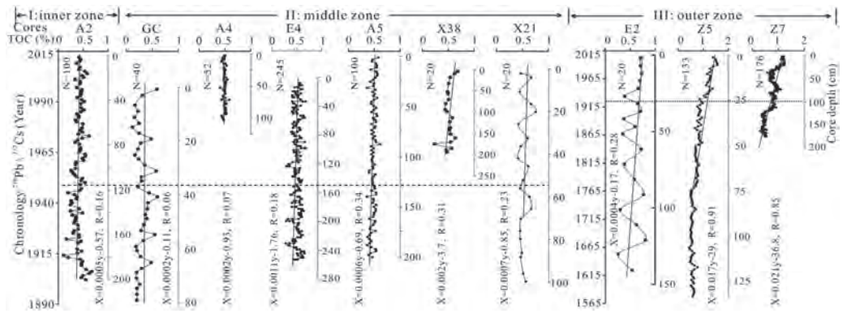


Fig. 4. Distribution of TOC (%) in core sediment. Chronology of cores is derived from sedimentation rates shown in Fig. 2.

Seasonal dynamics of particulate organic matter in the Changjiang Estuary and adjacent coastal waters illustrated by amino acid enantiomers

Ying Wu, Zongguang Liu, Jun Hu, Zhuoyi Zhu, Sumei Liu, Jing Zhang, ***Journal of Marine Systems,*** 2016, 154: 57-65.

Total suspended matter (TSM) was collected in the Changjiang Estuary and adjacent areas of the East China Sea in July, August, and November 2011, to study the composition and fate of particulate organic nitrogen (PON) during an August typhoon event and bottom trawling activities. Concentrations of particulate organic carbon (POC), particulate nitrogen (PN), and hydrolyzable particulate amino acids (PAA, D- and L-enantiomers) were higher during July and August than during November; however, D-arginine and alanine levelswere significantly higher in November. Seasonal trends in the composition of PAAs indicate that in situ production is a key factor in their temporal distribution. No significant increase in TSM or decrease in labile organic matter was observed during the transit period following a typhoon event in August. In contrast, higher primary production was observed at this time as a result of the penetration of Changjiang Diluted Water caused by the typhoon event. Trawling effects were studied by comparing the calm season (July) with the bottom-trawling period (November) at similar sampling sites. The effect of trawling on the composition of bottom organic matter was studied by comparing D-amino acids concentrations and C/N ratios in the calm season (July) with the bottom-trawling period (November). A substantial contribution of microbial organic matter during the November cruise was indicated by a decrease in glutamic acid, an increase in TSM and D-alanine, and a lower carbon/nitrogen (C/N) ratio. In shallow coastal regions, anthropogenic activities (bottom trawling) may enhance the transfer of low-nutritional value particulate organic matter into the benthic food chain.

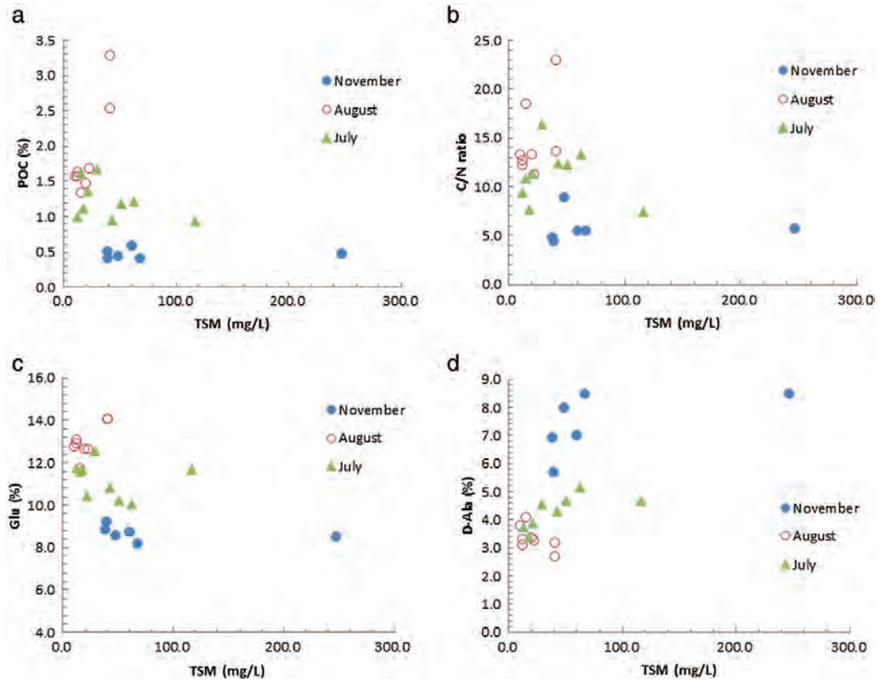


Fig. 5. Relationships among various parameter of particulates in the bottomlayer collected from three cruises: (a) POC (%) vs. TSM; (b) C/N vs. TSM; (c) glumatic acid (%) vs. TSM; (d) D-alanine (%) vs. TSM.

Bacterial Diversity in Submarine Groundwater along the Coasts of the Yellow Sea

Qi Ye, Jian'an Liu, Jinzhou Du and Jing Zhang, ***Frontiers in Microbiology,*** 2016, 6: 1519.

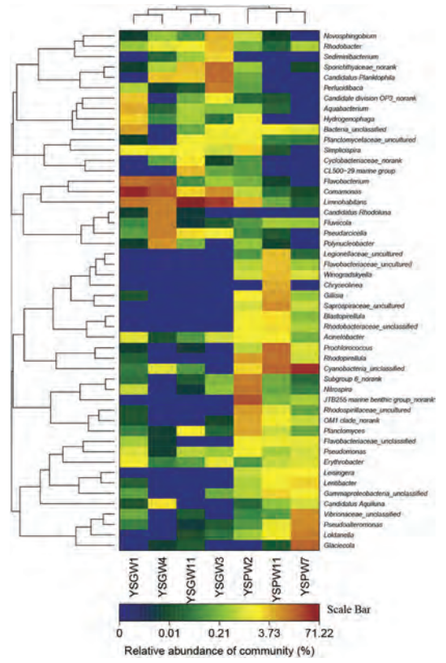


FIGURE 2 | Heatmap showing the relative abundance and distribution of genus-based OTU illumina reads. The color code indicates relative abundance, ranging from blue (lowabundance) to black to brown (high abundance).

Submarine groundwater (SGD)is one of the most significant pathways for the exchange of groundwater and/or source of nutrients, metals and carbon to the ocean, subsequently cause deleterious impacts on the coastal ecosystems. Microorganisms have been recognized as the important participators in the biogeochemical processes in the SGD. Inthisstudy, by utilizing 16S rRNA-based Illumina Miseq sequencing technology, we investigated bacterial diversity and distribution in both fresh well water and brackish recirculated porewater along the coasts in the Yellow Sea.The results showed that *Actinobacteria* and *Betaproteobacteria*, especially *Comamonas* spp.and *Limnohabitans* spp. were dominated in fresh well samples. Distinct patterns of bacterial communities were found among the porewater samples due to different locations, for examples, *Cyanbacteria* was the most abundant in the porewater samples far from the algal bloomed areas.The analysis of correlation between representative bacterial taxonomic groups and the contexture environmental parameters showed that fresh well water and brackish porewater might provide different nutrients to the coastal waters. Potential key bacterial groups such as *Comamonas* spp. maybe excellent candidates for the bioremediation of the natural pollutants in the SGD. Our comprehensive understanding of bacterial diversity in the SGD along the coasts of the Yellow Sea will create a basis for designing the effective clean-up approach *in-situ*, and provide valuable information for the coastal management.

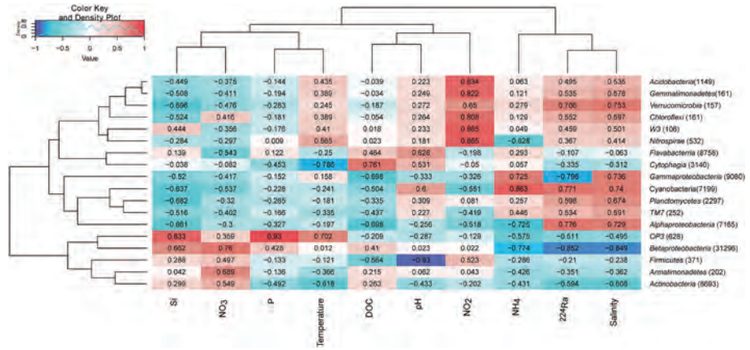


FIGURE7 | **Environmental factors associated with variations of the bacterial community structure at the phylum level.** In order to obtain a higher resolution, the *Proteobacteria* phylum level was separated into *Alpha*, *Beta*, and *Gamma-Proteobacteria* classes. Phylum *Bacteriodetes* was separated into classes *Flavabacterria* and *Cytophagia*. The total number of sequences in each phylum is indicated in parentheses.Pearson's correlation coefficients between-1 and 1 are shown in the rectangle, which indicates correlations between phylum/class sequence abundance and selected environmental parameters. For example, a firebrick colored rectangle (0.76) between nitrate and *Betaproteobacteria* indicates a higher number of sequences with increasing nitrate concentration,a blue rectangle (−0.774)between *Betaproteobacteria* and ammonium indicates a higher number of sequences with decreasing ammonium concentration.The color code indicates Pearson's correlation coefficients,ranging from blue(−1)to white(0)to firebrick(1). The density showed the distribution of Pearson's correlation coefficients between −1 and1. Si, silicate; P, phosphate; NO_2, nitrite; NO_3, nitrate; NH_4, ammonium; ^{224}Ra, Radium isotope tracer; DOC, dissolved organic carbon.

Distribution of hypoxia and pycnocline off the Changjiang Estuary, China
Jianrong Zhu, Zhuoyi Zhu, Jun Lin, HuiWu, Jing Zhang, ***Journal of Marine Systems,*** 2016, 154: 28-40.

The distributions of hypoxia and the pycnocline off the Changjiang Estuary were investigated by making several field observations from June 2 to 11, from July 18 to 23, from August 20 to 30, from October 3 to 13, 2006, and from August 27 to September 3, 2009. The observations from July 18 to 23, 2006, mainly focused on analyzing the relationship between hypoxia and the extension of the river plume and vertical stratification. In July, the Changjiang diluted water (CDW) was influenced by the easterly typhoon winds, causing it to extend northward rather than northeastward. By using the maximum vertical density gradient as a stratification intensity index, we found that the area of low (<3mg/L) dissolved oxygen (DO) was similar to the area of the pycnocline (>2.0 kg/m^4), which indicated that the summer pycnocline can effectively block vertical DO exchange and maintain hypoxia near the bottom. The observed hypoxic area was 500 km^2, which was much smaller than the hypoxic areas observed in previous studies, and occurred because of the enhanced mixing that resulted from Typhoon Bill. During the observation period of August 20–30, 2006, the maximum density gradient was weaker due to distinct low river discharge. No hypoxia was observed in the eastern and southeastern sea off the Changjiang Estuary where hypoxia often occurs. However, hypoxia occurred over a large area of 15,400 km^2 in the northern observation domain where hypoxia rarely occurs. During June 2–11 and October 3–13, 2006, the maximum density gradient was weaker, and the area with low DO was smaller than in July 2006. This finding resulted from relatively low river discharge and weaker solar heating. Consequently, no hypoxia occurred in the bottom layer. The area of low DO was similar to that of the maximum vertical density gradient. From August 27 to September 3, 2009, high river discharge and strong solar heating produced a larger and more intense pycnocline. The hypoxic area reached 3735 km^2 and was very similar to the area of the pycnocline, which was greater than 3.0 kg/m^4. The seasonal variations of the pycnocline were consistent with those of hypoxia, and the pycnocline played an important role in preserving hypoxic conditions. The seasonal influences of biogeochemical process on hypoxia in 2006 were discussed. The residual current speeds at the bottom were small and favorable for maintaining hypoxia during the summer.

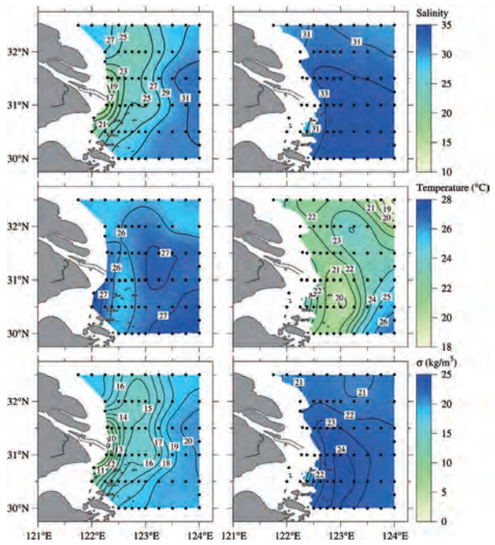


Fig. 2.Horizontal distribution of the salinity (upper panels), temperature (middle panels) and density anomaly (lower panels) at a depth of 1m (left panels) and 20m (right panels) below the sea surface. The black dots are the measurement sites.

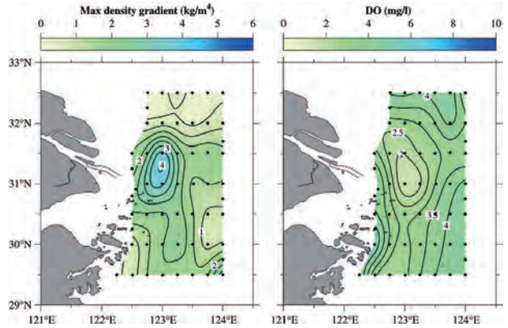


Fig. 13. Horizontal distribution of the maximum density gradient (left) and DO distribution in the bottom waters (right) during the observation period August 27 to September 3, 2009.

交流与合作
Academic Exchange & Cooperation

实验室积极开展国际交流与合作，目前承担了政府间国际科技创新合作重点专项和“龙计划”3期等国际合作项目6项。
SKLEC is actively involved in international communicationsand cooperation. SKLEC is currently in charge of 6 internationally cooperation projects, including the intergovernmental international scientific and technological innovation cooperation special plan and the ESA-MOST Dragon 3 programme.

2016年实验室接待国内外学者、专家来室合作研究与学术交流70多人次。37人次参加国际学术会议并进行学术交流，其中邀请报告（含大会报告）8次。主/承办6次国际会议及3次国内学术研讨会。2016年实验室共举办学术报告近70场次。
More than 70 scholars visited SKLEC in 2016. SKLEC researchers attended international conferences for 37 person-times, including 8 plenary lectures and invited people to talks. In 2016, SKLEC hosted six international conferences and three national conferences. Nearly 70 lectures were given in SKLEC in total.

2016年，实验室科研人员前往世界各地进行野外联合考察，包括4月前往克罗地亚与克罗地亚鲁杰尔·博什科维奇研究所的科研人员联合开展克尔卡河中下游实地调查；8月，赴马来西亚与马来西亚沙捞越大学的科研人员在拉让河流域联合开展野外现场调查工作。2016年11月，实验室科研人员参加中国第33次南极考察队，远赴南极进行现场考察和采样。
In 2016, SKLEC researchers carried out a number of field works abroad. For example, In April we explored the middle and lower KRKA river (Croatia) with researchers from Rudjer Boskovic. In August we surveyed the Rajang river basin and adjacent rivers nearby Kuching (Malaysia) in collaboration with researchers from University of Malaysia Sarawak, respectively. In November, associate professor, ZHU Zhuoyi and Ph. D candidate, ZHANG Xiaohui participated in the China's 33rd Antarctic expedition for sampling and surveying.

Field Observations

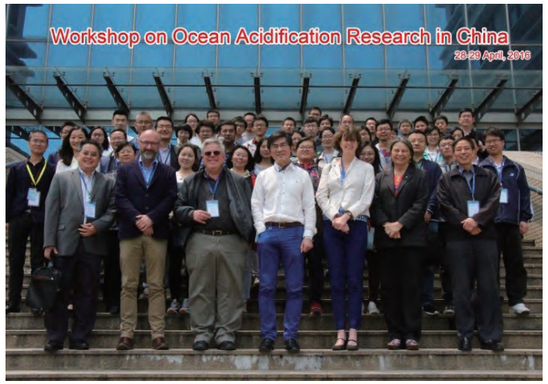
学术会议
Workshop & Conference

“西太平洋地区的气候变化及人类活动对珊瑚礁的影响”项目研讨会
IOC/WESTPAC-CorReCAP Project Workshop

2016年3月28-30日，实验室张经教授负责的部委科技项目“西太平洋地区的气候变化及人类活动对珊瑚礁的影响”项目研讨会在我室召开。会议主要围绕“西太平洋区域珊瑚礁体系”、“评估WESTPAC-CorReCAP项目进展和商讨下一阶段研究问题”、“计划WESTPAC-CorReCAP下一期培训课程”三个议题展开讨论。

IOC/WESTPAC-CorReCAP workshop organized by SKLEC was held on March 28th-30th, 2016 at East China Normal University, Shanghai. This workshop focused on the synthesis of coral reefs in West Pacific Region, the evaluation of WESTPAC-CorReCAP Project and the further works in the next stages, as well as the upcoming training course of WESTPAC-CorReCAP.

中国海洋酸化研究学术研讨会
Workshop on Ocean Acidification Research in China



2016年4月28-29日，“中国海洋酸化”学术研讨会在我校召开，会议由河口海岸学国家重点实验室主办，中-挪近海与海岸联合研究中心（SKLEC-NIVA Centre）和GOA-ON（Global Ocean Acidification - Observing Network）承办。海内外60余名优秀科学家参加此次研讨会，组织了15场精彩的学术报告。

During April 28th-29th, 2016, the Workshop on Ocean Acidification Research in China was held in SKLEC-NIVA Centre for Marine and Coastal Research, State Key Laboratory of Estuarine and Coastal Research (SKLEC), East China Normal University, Shanghai. More than 60 scientists and students from China and overseas participated in this workshop with 15 scientific presentations.

河口海岸学青年科学家学术论坛
Overseas Young Scientists Forum on Estuaries and Coasts

2016年6月26-28日，河口海岸学青年科学家学术论坛在我校举行，来自海内外的河口海岸学青年学者作了相关专题学术报告。此次会议得到了校人事处的支持，向参会学者介绍了实验室发展沿革以及研究进展状况，并诚邀有志青年加入，共同推进河口海岸学科的发展。

Overseas Young Scientists Forum on Estuaries and Coasts was held at ECNU's Zhongbei campus on June 26th-28th, 2016. This forum provided a venue for young scholars and academic scientists from China and overseas to discuss the latest results and techniques in applied and theoretical estuarine and coastal, also gave SKLEC a stage to show our support on young scientific researchers.

河口海岸生态系统生物地貌和空间格局国际前沿研讨会
SKLEC Workshop: Biogeomorphology and Pattern Formation on Estuaries and Coastal Ecosystems

2016年6月27日-30日，河口海岸生态系统生物地貌和空间格局国际前沿研讨会在华东师范大学中山北路校区举办。会议围绕国际生物地貌和河口海岸自组织格局形成过程与机制的目前研究进展、困难挑战和理论难题，以及就展开有关河口海岸生态系统空间格局形成、生态修复与保育、气候变化自适应力、营养物循环等几个议题于27日、29日组织了17场精彩的学术报告。

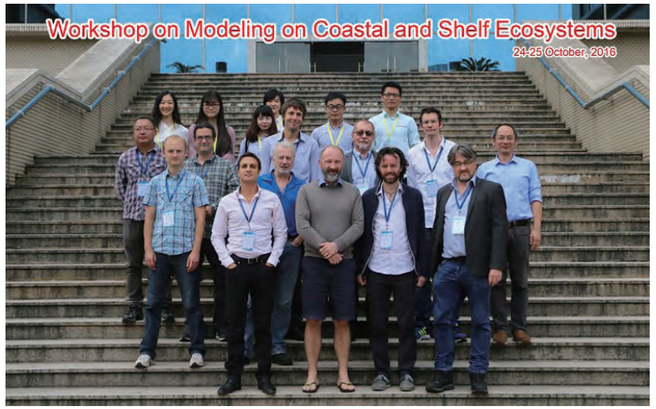
On June 27th-30th, 2016, SKLEC Workshop: Biogeomorphology and pattern formation of estuaries and coastal ecosystems was held in ECNU's Zhongbei campus. The purpose of this workshop was to discuss the urgent need for aligning the combined knowledge of mathematicians with that of ecologists on significant ecological and environmental problems in both the theoretical and applied realms in estuaries, coastal and marine ecosystems. There were 17 outstanding presentations in the workshop, and more than 40 researchers shared new research results and various insights on the related topics.

河口海岸学国家重点实验室第三届国际咨询会暨河口海岸学学术论坛
The 3rd SKLEC International Consultation Meeting

2016年10月19日下午，河口海岸学国家重点实验室第三届国际咨询会在华东师范大学召开。河口海岸学国家重点实验室国际咨询委员会于2012年成立，并于2012年和2014年召开了第一届和第二届国际咨询会。10月20至21日，河口海岸学术论坛在华东师范大学召开，河口海岸科学研究领域知名学者针对河口海岸前沿科学问题做了25场精彩的学术报告，并做了充分的讨论。

On October 19th, 2016, the 3rd SKLEC International Consultation Meeting was held in ECNU. The International Consultation Panel of SKLEC was established in 2012, and the first and second meeting were held on October 2012 and October 2014, respectively. From October 20th-21st, the 3rd Workshop on Estuarine and Coastal Research was held in ECNU. 25 outstanding presentations were given in total, with deep discussions on hot topics of estuarine and coastal research.

海岸陆架生态系统模型研讨会
Workshop on Ocean Acidification Research



2016年10月24至26日，由我室主办、我室中挪近海与海岸联合研究中心承办的海岸陆架生态系统模型研讨会在我校召开。会上，专家对各自研究领域使用的海洋模型及其相关耦合进行了介绍，对海岸海岸陆架生态系统建模现状进行了分析。同时，围绕“如何按比例缩小到局部尺度”、“如何为最终用户提供相关知识”和“国际社会如何为社会生态系统研究提供相关新知识做出综合努力”三个建模领域热点议题展开讨论。

During October 24th-26th, 2016, the Workshop on Ocean Acidification Research in China was held in SKLEC-NIVA Centre for Marine and Coastal Research, SKLEC, ECNU. Discussions are focused on Modeling on Coastal and Shelf Ecosystems, with three aspects of challenges: 1) Downscaling to local scale and back again, 2) Delivering relevant knowledge for end-users and current, and 3) An integrated international effort towards delivering relevant new knowledge for studies on socio-ecological systems.

第283期东方科技论坛-微塑料海洋污染与控制学术研讨会
Workshop on Pollution of Marine Micro Plastic and Its Control

由上海市人民政府、中国科学院和中国工程院主办，华东师范大学承办的第283期东方科技论坛于2016年10月29日在上海沪杏科技图书馆举行。此次会议执行主席为高抒教授和李道季教授。会议聚集了国内外从事海洋微塑料研究相关的40余位专家学者，围绕“微塑料海洋污染与控制”这一主题，从海洋微塑料研究领域的科学问题、现有的观测方法与技术、相关管理制度等方面展开了丰富、热烈的讨论。

On October 29th, 2016, the 283rd Eastern Forum of Science and Technology was held at Shanghai Huxin Library. It was hosted by Shanghai Municipal People's Government, the Chinese Academy of Sciences, and the Chinese Academy of Engineering, held by East China Normal University. Prof. GAO Shu and LI Daoji chaired the forum. More than 40 experts of marine micro plastic attended the workshop. They discussed the theme of this workshop “Pollution of marine micro plastic and its control”.

河口海岸学战略研讨会
Workshop Series on the New Directions of Estuarine and Coastal Studies

2016年7月1-3日，由国家自然科学基金委资助的河口海岸学战略研讨会在华东师范大学河口海岸学国家重点实验室举行。此次会议邀请了国内河口海岸领域的30余位知名学者出席。与会专家就“全球气候变化和人类活动引发的河口海岸系统转换”这一主题展开热烈地讨论，围绕国家和学科需求，对比国际先进研究水平，找出阻碍学科发展的瓶颈和因素，针对未来发展的机遇和重点方向，提出发展新思路。

During July 1st-3rd, 2016, a workshop on the new directions of estuarine and coastal studies was held in SKLEC, ECNU. More than 30 experts attended the meeting. They discussed estuarine and coastal system transformation caused by global climate change and human activities.

“地貌学”课程教学与数字资源建设会议
Workshop on Course Teaching and Digital Resources Construction on Geomorphology

由教育部高等学校地理科学类专业教学指导分委员会和高等教育出版社主办、华东师范大学承办的全国高等学校“地貌学”课程教学与数字资源建设研讨会于2016年7月25-27日在河口海岸学国家重点实验室举行。来自16所高校的30余位国内地貌学专家和学者出席了本次会议。北京大学周力平教授、兰州大学潘保田教授、华东师范大学郑祥民教授和高抒教授作了大会主题报告。与会专家学者就地貌学发展趋势以及地貌学教学教改模式的共同探讨。

The workshop on Course Teaching and Digital Resources Construction on Geomorphology was held during July, 25th-27th, 2016. It was held by SKLEC, ECNU and hosted by the Ministry of Education’s Steering Committee on the Teaching of Geographical Science in Higher Educational Institutions and Higher Education Press. More than 30 experts attended this meeting who were from 16 universities. Prof. ZHOU Liping from Peking University, Prof PAN Baotian from Lanzhou University, and Prof. ZHENG Xiangmin, Prof. GAO Shu from ECNU gave plenary lectures. The experts discussed the geomorphology development trend and geomorphology teaching reform model.

邀请报告
Invited Presentations at International Conferences & Workshops

2016年实验室有37人次参加国际学术会议并进行学术交流，其中邀请报告5次，大会报告3次。。

Members of SKLEC attended international conferences for more than 30 person-times, including 5 public talks and 3 plenary lectures.

Richard BELLERBY, The importance of delivering relevant science for socio-ecological studies of marginal seas-***The 3rd SKLEC International Consultation Meeting and Workshop on Estuarine and Coastal Research***, October 20th-21st, Shanghai, China.

LIU Dongyan, The world’s largest macroalgal bloom in the Yellow Sea, China: Formation and implications-***The 3rd SKLEC International Consultation Meeting and Workshop on Estuarine and Coastal Research***, October 20th-21st, Shanghai, China.

SHI Huahong, Marine Plastic Research in China-***The 3rd SKLEC International Consultation Meeting and Workshop on Estuarine and Coastal Research***, October 20th-21st, Shanghai, China.

GAO Shu, Mechanisms responsible for the difference in Changjiang River sediment discharge between middle-reach and estuarine locations-***The 3rd SKLEC International Consultation Meeting and Workshop on Estuarine and Coastal Research***, October 20th-21st, Shanghai, China.

HE Qing, Fine sediment dynamics and source-sink transformation in response to human activities in the Yangtze Estuary- ***SKLEC Workshop: Biogeomorphology and pattern formation on estuaries and coastal ecosystems***, June 27th-30th, Shanghai, China.

GAO Shu, Biogeomorphic processes influencing salt marsh sedimentation, Jiangsu coast, eastern China- ***SKLEC Workshop: Biogeomorphology and pattern formation on estuaries and coastal ecosystems***, June 27th-30th, Shanghai, China.

Richard BELLERBY, Approaches for relevant socio-ecological research - ***2nd Interdisciplinary Symposium on Ocean Acidification and Climate Change***, December 5th-9th, Hongkong, China.

Richard BELLERBY, Ocean acidification from space-***Marine Carbon from Space ($SatCO_2$): Joint Science Workshop and Training***, December 11th-14th, Hangzhou, China.

专家学者来访
Visiting Scholars

2016年实验室接待国内外专家、学者来室合作研究与学术交流70多人次。
In 2016, more than 70 scholars visited SKLEC.

List of Visiting Scholars

专家 Visiting Scholar	单位 Affiliation	备注 Remark
Gerhard Kattner	Alfred Wegener Institute Helmholtz Center for Polar and Marine Research, German	
Huib de Vriend	Delft University of Technology, the Netherlands	
WANG Zhengbing	Delft University of Technology, the Netherlands	
Marcel Stive	Delft University of Technology, the Netherlands	
J.C. Winterwerp	Delft University of Technology, the Netherlands	
Yoshiki Saito	Geological Survey of Japan, Japan	
Norbert Hertkorn	Helmholtz Zentrum Muenchen, German	
Bob Su	ITC/University of Twente, the Netherlands	
Wouter Verhoef	ITC/University of Twente, the Netherlands	
YANG Zhaoqing	Pacific Northwest National Laboratory, USA	
Alice Newton	University of Algarve, Portugal	
Michael Lazar	University of Haifa, Israel	
Willard S. Moore	University of South Carolina, USA	
Ulo Mander	University of Tartu, Estonia	
Bernhard Peucer-Ehrenbrink	Woods Hole Oceanographic Institution, USA	
Mark Baskaran	Wayne State University, USA	高端外专 High-end Foreign Experts
Ian Townend	University of Southampton, UK	海外高层次专家 High-End Expert Award
Blaženka Gašparovi	Rudjer Boskovic Institute, Croatia	开放课题 SKLEC Open Fund Recipient
Moritz Müller	Swinburne University of Technology Sarawak Campus, Malaysia	开放课题 SKLEC Open Fund Recipient
Aazani Mujahid	University Malaysia Sarawak, Malaysia	开放课题 SKLEC Open Fund Recipient
Christiaan van der Tol	University of Twente, the Netherlands	开放课题 SKLEC Open Fund Recipient
SHEN Jian	Virginia Institute of Marine Science, USA	上海市千人 Shanghai Thousand Talents
David Bruno Ryves	Loughborough University, UK	
Kenneth Lee	Australian Resources Research Centre, Australia	
Fagherazzi Sergio	Boston University, USA	
John K.Keesing	Commonwealth Scientific and Industrial Research Organisation Marine and Atmospheric Research, Australia	
Curtis J. Richardson	Duck University, USA	
ZHU Baoli	Helmholtz Zentrum München, German	
Hans von Storch	Institute for Coastal Research of the Helmholtz-Zentrum Geesthacht, German	
Stefano Ruffo	International School for Advanced Studies, Italy	
Geun Ha Park	Korea Institute of Ocean Science & Technology , South Korea	
Gi Hoon Hong	Korea Institute of Ocean Science & Technology , South Korea	
Z. George Xue	Louisiana State University, USA	
Christopher F D'Elia	Louisiana State University, USA	
Sam Bentley	Louisiana State University, USA	
XU Yijun	Louisiana State University, USA	
Baris Salihoglu	Middle East Technical University , Turkey	
FENG Huan	Montclair State University, USA	
ZHENG Jian	National Institute of Radiological Sciences, Japan	
Libby Jewett	National Oceanic and Atmospheric Administration, USA	
Richard Feely	National Oceanic and Atmospheric Administration, USA	
Johan van de Koppel	NIOZ-Yerseke, the Netherlands	
HE Ruoying	North Carolina State University, USA	
Evgeniy.Yakushev	Norwegian Institute for Water Research, Norway	
Philip.Wallhead	Norwegian Institute for Water Research, Norway	
Andrea E. Copping	Pacific Northwest National Laboratory, USA	

专家 Visiting Scholar	单位 Affiliation	备注 Remark
Gennadi Lessin	Plymouth Marine Laboratory, UK	
Icarus Allen	Plymouth Marine Laboratory, UK	
Jorn Bruggeman	Plymouth Marine Laboratory, UK	
Ricardo Torres	Plymouth Marine Laboratory, UK	
Yuri Artioli	Plymouth Marine Laboratory, UK	
Michael Bender	Princeton University, USA	
Thamasak Yeemin	Ramkhamhaeng University, Thailand	
TIAN Xin	Singapore University of Technology and Design, Singapore	
Michael St. John	Technical University of Denmark (DTU), Denmark	
Hugh Roarty	The Sate University of New Jersey, USA	
Scott Glenn	The Sate University of New Jersey, USA	
TANG Jianwu	The University of Chicago, USA	
Andrea D’ Alpaos	University of Padova, Italy	
Stijn Temmerman	University of Antwerpen, Beigium	
Christian Lindemann	University of Bergen, Norway	
Carol Robinson	University of East Anglia, UK	
Revital Bookman	University of Haifa, Israel	
Uri Schattner	University of Haifa, Israel	
Shirra Freeman	University of Haifa, Israel	
Alaa Salem	University of Kafrelsheikh, Egypt	
Patricia M. Glibert	University of Maryland , USA	
Fernando Pascual Siringan	University of the Philippines, Malaysia	
Jan Newton	University of Washington, USA	
John Morrison	University of Wollongong, Australia	
Guy Gelfenbaum	USGS Pacific Coastal and Marine Science Center, USA	
Matt Kirwan	Virginia Institute of Marine Science, USA	
Jerome Maa Pea-Yea	Virginia Institute of Marine Science, USA	

开放基金
SKLEC Research Fund

2016年，实验室在研开放基金课题24项，共194.2万元，新增开放基金课题13项，共134万元。
There were 24 on-going projects that were funded by SKLEC with a total of 1.94 million RMB in 2016. 13 new projects were approved in 2016 with a funding total of 1.34 million RMB.

2016年河口海岸学国家重点实验室设立开放基金课题
Research Fund Projects in 2016

姓名 Name	课题名称 Title	单位 Affiliation
高建华 GAO Jianhua	辽东半岛东岸全新世泥质沉积体系的形成和演化过程对鸭绿江流域变化的响应 The response of formation and evolvement process of the Holocene mud deposition system along the eastern Liaodong Peninsula to Yalu River catchment changes	南京大学 Nanjing University
Mark Baskaran	Intercomparison between $^{210}Pb_{ex}$, ^{137}Cs and $^{239,240}Pu$-based sedimentation rates in the China marginal sea	Wayne State University, USA
高峥 GAO Zheng	黄河口湿地微生物介导的硝酸盐还原过程与机制研究 The research on the processes and mechanism of microorganisms conducted nitrate reduction in the wetlands in Yellow River Estuary	山东农业大学 Shandong Agricultural University
宏波 HONG Bo	南海北部河口-陆架物质交换动力机制研究 Dynamics of estuary-shelf exchange in the northern South China Sea	华南理工大学 South China University of Technology
YANG Zhaoqing	气候变化与人类活动影响下的海岸潮滩生态地貌响应过程模拟 Modeling ecological dynamics process of coastal geomorphology under climate change and anthropogenic activities	Pacific Northwest National Laboratory, USA
Samina Kidwai	Variation of phytoplankton pigments composition and their ecological implications in the major four Creeks of Indus Delta (Pakistan)	National Institute of Oceanography, Ministry of Science and Technology, Pakistan
FENG Huan & Robert S. Prezant	Multidisciplinary study of macrobenthos community response to sediment metal contamination in Yangtze River delta intertidal zone	Montclair State University, USA
王小华 WANG Xiaohua	洋山港沉积环境及港口建设对其影响的研究 Modelling sedimentation response to the construction of Yangshan Harbour, Shanghai, China	The University of New South Wales, Austrialia
史本伟 SHI Benwei	文蛤养殖对潮滩地貌动力过程及演化模式的影响研究 Morphodynamics processes at an intertidal mudflat under influences of clam cultivation	南京大学 Nanjing University
Moritz Müller	Where is the missing CO_2? Interactions of biogeochemistry and microbial dynamics impacting CO_2 release and organic carbon transport from tropical peat-draining rivers to the ocean	Swinburne University of Technology Sarawak, Malaysia
李恒翔 LI Hengxiang	珠江口水产养殖环境中微塑料的污染特征 Occurrence of microplastics in aquaculture environment of Pearl River Estuary	中国科学院南海海洋研究所 South China Sea Institute of Oceanology, Chinese Academy of Sciences
袁瑞 YUAN Rui	扬子浅滩对长江冲淡水扩展的影响 The impact of Yangtze Shoal on the Changjiang plume extension	上海海事大学 Shanghai Maritime University
范中亚 FAN Zhongya	台风对珠江口氮、磷营养盐输运的影响 The effect of typhoon on nitrogen and phosphorus transport in Pearl estuary	环境保护部华南环境科学研究所 South China Institute of Environmental Sciences, the Ministry of Environmental Protection

论文专著
List of Peer Reviewed Publications

2016年，实验室在国内外重要刊物上发表学术论文190多篇，其中国外刊物140多篇，国内重要刊物52篇；主编专辑2卷；出版学术著作2部。
In 2016, SKLEC published more than 190 peer-reviewed papers and books, among which 140 papers were published in the international journals, 52 papers were published on the domestic journals. Researchers of SKLEC edited 2 special issues for international journal and published 2 monographs.

国外刊物发表论文列表
List of International Peer Reviewed Publications

[1] Bailey, S.B., Mao, X.G., Struebig, M., Tsagkogeorga, G., Csorba, G., Heaney, L.R., Sedlock, J., Stanley, W., Rouillard, J., Rossiter, S.J.*,The use of museum samples for large-scale sequence capture: a study of congeneric horseshoe bats (family Rhinolophidae). ***BIOLOGICAL JOURNAL OF THE LINNEAN SOCIETY***, 2016, 117: 58-70.

[2] Bao, J.L.*, Gao, S., Environmental characteristics and land-use pattern changes of the Old Huanghe River delta, eastern China, in the sixteenth to twentieth centuries. SUSTAINABILITY SCIENCE, 2016, 11(4SI): 695-709.

[3] Chang, Y.*, Zhang, J., Qu, J.G., Jiang, Z.J., Zhang, R.F., Influence of mariculture on the distribution of dissolved inorganic selenium in Sanggou Bay, northern China. ***AQUACULTURE ENVIRONMENT INTERACTIONS***, 2016, 8: 247-260.

[4] Chang, Y.*, Zhang, J., Qu, J.G.,Zhang, G.S., Zhang, A.Y., Zhang, R.F., The behavior of dissolved inorganic selenium in the Changjiang Estuary. ***JOURNAL OF MARINE SYSTEMS***, 2016, 154: 110-121.

[5] Chen, F., Hou, L.J.*, Liu, M., Zheng, Y.L., Yin, G.Y., Lin, X.B., Li, X.F., Zong, H.B., Deng, F.Y., Gao, J., Jiang, X.F., Net anthropogenic nitrogen inputs (NANI) into the Yangtze River basin and the relationship with riverine nitrogen export. ***JOURNAL OF GEOPHYSICAL RESEARCH-BIOGEOSCIENCES***, 2016, 121(2): 451-465.

[6] Chen, J., Finlayson, B.L.*, Wei, T.Y., Sun, Q.L., Webber, M., Li, M.T., Chen, Z.Y., Changes in monthly flows in the Yangtze River, China - With special reference to the Three Gorges Dam. ***JOURNAL OF HYDROLOGY***, 2016, 536: 293-301.

[7] Cheng, L., Li, X.F., Lin, X.B., Hou, L.J.*, Liu, M.*, Li, Y., Liu, S., Hu, X.T., Dissimilatory nitrate reduction processes in sediments of urbanriver networks: Spatiotemporal variations and environmental implications. ***ENVIRONMENTAL POLLUTION***, 2016, 219: 545-554.

[8] Dai, Z.J.*, Fagherazzi, S., Mei, X.F., Gao,J.J., Decline in suspended sediment concentration delivered by the Changjiang (Yangtze) River into the East China Sea between 1956 and 2013. ***GEOMORPHOLOGY***, 2016, 268: 123-132.

[9] Dai, Z.J.*, Fagherazzi, S., Mei, X.F., Chen, J.Y., Meng, Y., Linking the infilling of the North Branch in the Changjiang (Yangtze) estuary to anthropogenic activities from 1958 to 2013. ***MARINE GEOLOGY***, 2016, 379: 1-12.

[10] Dong, D.*, Zou, Y., Zhang, P., Wu, Z.H.*, Systematic analyses and comprehensive field synopsis of genetic association studies in hepatocellular carcinoma. ***ONCOTARGET***, 2016, 7(29): 45757-45763.

论文专著
List of Peer Reviewed Publications

[11] Du, J., Du, J.Z.*, Huang, D.K., Wang, J.L., Zhang, J., Zhang, J., Seasonal distribution patterns of ^{7}Be and ^{210}Pb in surface sediments in the Changjiang Estuary, China and their implication. ***JOURNAL OF MARINE SYSTEMS***, 2016, 154: 41-49.

[12] Du, J.L., Yang, S.L.*, Feng, H., Recent human impacts on the morphological evolution of the Yangtze River delta foreland: A review and new perspectives. ***ESTUARINE COASTAL AND SHELF SCIENCE***, 2016, 181: 160-169.

[13] Fang, J.G.*, Zhang, J., Xiao, T., Huang, D.J., Liu, S.M., Integrated multi-trophic aquaculture (IMTA) in Sanggou Bay, China (INTRODUCTION). ***AQUACULTURE ENVIRONMENT INTERACTIONS***, 2016, 8: 201-205.

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[16] Fu, Q., Li, Y., Yang, Y.J., Li, C.,Yao, J., Zeng, Q.F., Qin, Z.K., Liu, S.K., Li D.J., Liu, Z.J.*, Septin genes in channel catfish (*Ictalurus punctatus*) and their involvement in disease defense responses. ***FISH & SHELLFISH IMMUNOLOGY***, 2016, 49: 110-121.

[17] Gan, S.C., Wu, Y.*, Zhang, J., Bioavailability of dissolved organic carbon linked with the regional carbon cycle in the East China Sea. ***DEEP-SEA RESEARCH PART II-TOPICAL STUDIES IN OCEANOGRAPHY***, 2016, 124: 19-28.

[18] Gao, C.B., Fu, Q., Su, B.F., Zhou, S., Liu, F.Q., Song, L., Zhang, M., Ren, Y.C. Dong, X.Y., Tan, F.H., Li, C.*, Transcriptomic profiling revealed the signatures of intestinal barrier alteration and pathogen entry in turbot (*Scophthalmus maximus*) following *Vibrio anguillarum* challenge. ***DEVELOPMENTAL AND COMPARATIVE IMMUNOLOGY***, 2016, 65: 159-168.

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[22] Ge, Z.M.*, Wang, H., Cao, H.B., Zhao, B., Zhou, X., Peltola, H.L., Cui, L.F., Li, X.Z., Zhang, L.Q., Responses of eastern Chinese coastal salt marshes to sea-level rise combined with vegetative and sedimentary processes. ***SCIENTIFIC REPORTS***, 2016,6:28466.

[23] Ge, Z.P., Shi, H.H., Mei, X.F., Dai, Z.J., Li, D.J.*, Semi-automatic recognition of marine debris on beaches. ***SCIENTIFIC REPORTS***, 2016, 6: 25759.

[24] Glenn, S.M.*, Miles, T.N., Serokal, G.N., Xu, Y., Forney, R.K., Yu, F., Roarty, H., Schofield, O., Kohut, J., Stratified coastal ocean interactions with tropical cyclones. ***NATURE COMMUNICATIONS***, 2016, 7: 10887.

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[28] Hu, L.L., Su, L., Xue, Y.G., Mu, J.L., Zhu, J., Xu, J., Shi, H.H.*, Uptake, accumulation and elimination of polystyrene microspheres in tadpoles of *Xenopus tropicalis*. ***CHEMOSPHERE***, 2016, 164: 611-617.

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[31] Huang, J., Cheng, J.P.*, Yi, J., Impact of silver nanoparticles on marine diatom *Skeletonema costatum*. ***JOURNAL OF APPLIED TOXICOLOGY***, 2016, 36(10): 1343-1354.

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[33] Huang, Y., Salama, M.S., Su, Z.B., van der Velde, R., Zheng, D.H., Krol, M.S., Hoekstra, A.Y., Zhou, Y.X., Effects of Roughness Length Parameterizations on Regional-Scale Land Surface Modeling of Alpine Grasslands in the Yangtze River Basin. ***JOURNAL OF HYDROMETEOROLOGY***, 2016, 17(4): 1069-1085.

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主编专辑
Special Issue

[1] **Zhang, J.**, Xiao, T., Huang, D.J., Liu, S.M., Fang, J.G., Changjiang (Yangtze River) Estuary and Adjacent Marine Environment. ***JOURNAL OF MARINE SYSTEMS,*** 2016, 154(A): 1-130.

[1] **Zhang, J.**, Huang, D.J., Xiao, T., Liu, S., Fang, J.G., Response of Biogeochemical Cycles and Ecosystem in the East China Sea to the Multi-stressors. ***DEEP-SEA RESEARACH PART II,*** 2016, 124: 1-128.

著作
Books

[1] **丁平兴**，王厚杰，孟宪伟，朱建荣，张利权，单秀娟，气候变化影响下我国典型海岸带演变趋势与脆弱性评估，***科学出版社***，2016

[2] **程和琴，陈吉余**海平面上升对长江河口的影响研究，***科学出版社***，2016.

*说明：*表示通讯作者。*
*Ps: * refers to corresponding author.*

获奖与专利
Awards & Patents

Progress Prize in Scientific and Collective Technology

2016年，由我室朱建荣教授领衔完成的科研成果“长江河口盐水入侵动力过程及淡水资源利用中的关键技术”获得上海市科技进步二等奖。
Research on “Key Technologies of Saltwater Intrusion Dynamics and Freshwater Resource Utilization in the Changjiang River Estuary” was awarded level-2 prize by the Shanghai Progress in Science and Technology Award.

国家海洋局授予陈吉余先生“终身奉献奖”。
Prof. Chen Jiyu was awarded a Lifetime Achievement Award from the State Oceanic Administration.

实用新型专利
National Utility Model Patent

2016年度，实验室获4项发明获实用新型专利。
In 2016, SKLEC was authorized with 4 National Utility Model Patents.

专利名称 Patent Name	发明人 Inventor	专利号 Patent Number
铅鱼	顾靖华，王耐慈，朱礼鑫	ZL 2015 2 0738641.7
河口海岸底质采样器	顾靖华，戴志军，葛建忠	ZL 2016 2 0252235.4
大型可移动悬浮物剖面高分辨测量及可滑动取样装置	吴宇帆，朱建荣，顾靖华，林倩	ZL 2015 2 0868171.6
用于水体溶解态物质监测的被动采样采样装置	赵恒，徐江，栾华龙，于鹏，战毅，邢丛丛，周俊良，杨毅，李道季	ZL 2016 2 0421088.9

平台设施与野外观测
Facilities & Field Observations

平台与设施
Facilities

实验室现有野外台站横沙、长兴、堡镇、南门、崇西以及大通测站工作正常、数据有效。在大通站每两个月实施一次的定期采样观测有序进行。
The hydrological observation stations, including Hengsha, Changxing, Baozhen, Nanmen, Chongxi, and Datong, working properly. Regular sampling and surveying was carried out at the Datong Station, which is the most downstream national hydrological station on the Yangtze River, every two months.

2016年，开展了浮标等野外观测平台的建设工作，经过3次浮标选址内部论证后，拟于2017年在长江口南槽增布3个浮标。
Three buoys will be setup in the South Passage of the Yangtze Estuary in 2017.

长江河口及东海野外观测站分布图
Observation Stations in the Yangtze River Estuary and East China Sea

制作单位：华东师范大学河口海岸学国家重点实验室　　**制作时间：2017年3月9日**

新增野外大型仪器设备（20万元以上）
New Instruments for Field Survey

设备名称 Equipment	生产厂商/型号 Manufacturer/Type
CO_2测定仪/ CO_2 Measuring Instrument	Marianda / VINDTA 3C

氯霉素的降解机理
chloramphenicol(CAP) removel mechanism

通过检测和分析纳米铁与水中氯霉素的反应产物，首次提出氯霉素的降解机理。反应产物通过UPLC-MS 和HPLC检测和分析，通过分离各个产物并分析产物之间的关系，从而推测反应过程，提出反应机理。
The chloramphenicol (CAP) removal mechanism from aqueous solution by nanoscale zero-valent iron particles was first proposed through the investigation of the reduction products of CAP. The experiments were well designed and performed using UPLC-MS and HPLC. The results of detection helped us to reveal the chemical processes that occurred in great detail.

野外调查
Field Observations

基金委创新群体项目“高浊度河口及其邻近海域的陆海相互作用”2016年长江流域春季野外调查
Spring Observation in the Yangtze River Basin of NSFC Creative Research Groups Fund “Land-Sea Interaction in the High Turidity Estuaries and Its Adjacent Sea”

3月21日到4月8日，实验室张经教授任首席的国家基金委创新群体项目“高浊度河口及其邻近海域的陆海相互作用”，开展了2016年春季针对长江中下游流域的多学科野外观测。本次考察从重庆奉节开始，沿长江流域开展调查，进行水文泥沙、生源要素的观测和采样。项目组成员克服调查过程中暴雨等重重困难，圆满完成调查任务。
Prof. ZHANG Jing is the chief scientist of NSFC Creative Research Groups Fund “Land-Sea Interaction in the High Turidity Estuaries and Its Adjacent Sea”. During 21st Mar. to 8th Apr., 2016, Spring Observation of this project was held from Chongqing Fengjie and cover the Yangtze River basin began. The investigator factors include hydrology, sediment and biogenic elements.

实验室自主研究项目“长江冲淡水锋面动力过程及其生态效应”春季综合调查
Spring Observation of SKLEC Special fund project “Frontal Dynamics and Ecological Effects of the Changjiang River Plume (FroDEE)”

5月5日至27日，实验室自主研究项目“长江冲淡水锋面动力过程及其生态效应”春季综合调查航次顺利完成实施。
Spring Observation of SKLEC Special fund project “Frontal Dynamics and Ecological Effects of the Changjiang River Plume (FroDEE) was held during 5th-27th May, 2016.

本次调查由国家海洋调查船队成员船“浙海科1号”执行。吴辉副研究员任首席科学家、顾靖华工程师任物理海洋观测技术指导，来自不同课题组的11名学生参加了航次。考察项目包括物理海洋、海洋生物、海洋化学、海洋地质、海洋遥感等内容。在科考人员的精心设计和船方的积极配合下，本航次航行了2500海里，观测了20个断面的156个站位，获取了其中每一个站位的温度、盐度、流速、遥感、浊度、溶解氧、叶绿素和pH值数据；并同时进行了隔站水样、悬浮颗粒物、浮游生物和表层沉积物样品的采集，圆满完成了调查任务。
The observation was carried out by the member of national Marine survey ship- “Zhehai 1”, and associate professor WU Hui is the chief scientist, the engineer Mr. GU Jinghua is the technical tutor of physical observation. Other than the temperature, salinity, flow rate, remote sensing, turbidity, dissolved organic, chlorophyll, and pH, the observation also covered sampling for suspended particle, plankton, and overlying deposit.

本次调查旨在揭示长江冲淡水区域赤潮事件背后的动力成因，而在观测过程中，正值大规模赤潮事件爆发，南北绵延200余公里，并有几个显著的严重爆发区，在此情况下，科考人员果断在关键区域进行了加密采样，从而获取了宝贵而完整的数据。
During the observation process, as the large-scale red tides events outbreak, the aims of this observation is to reveal the dynamic cause behind the red tide events in the Yangtze diluted water.

基金委长江口共享航次项目“长江口科学考察实验研究”2016年度野外调查
NSFC Public Cruise Fund “Scientific Observation on the Yangtze River Estuary” Observation in 2016

3月5日至20日、7月2至30日，国家自然科学基金委海洋科学共享航次“长江口科学考察实验研究”（航次编号：NORC2016-03）分别圆满完成枯季航段和洪季航段的连续两次野外作业内容。
Three cruises of NSFC Public Cruise Fund “Scientific Observation on the Yangtze River Estuary” in winter and summer were successfully completed.

本次调查由国家海洋调查船队成员船“润江1号”执行，华东师范大学高磊副研究员、张卫国研究员、吴辉副研究员分别担任现场首席科学家。国内涉海高校和海洋机构的54名科考队员参加了航次。
They were carried out by the member of national Marine survey ship-‘Runjiang 1’, and associate professor GAO Lei, Prof. ZHANG Weiguo, associate professor WU Hui were the chief scientists in the field. 54 scientific staff attended the cruises.

此次考察项目包括物理海洋、海洋地质、海洋化学、海洋生物、海洋遥感等内容。在科考队员的精心计划和船方的积极配合下，本航次安全、高效地完成任务书中断面和站位的观测与采样，同时还增做了4个长江口及杭州湾站点以及约75公里的多波束探测。
The observation of physical oceanology, marine geology, marine chemistry, marine biology, and marine remote sensing was covered. Along with the stations and sections in the project specification, four stations in the Yangtze River Estuary and Hangzhou Bay and a multi-beam detection section about 75 km were carried.

人才培养
Student Programs

2016年实验室在读研究生273人，其中博士研究生125人，硕士研究生148人。
There are 273 postgraduate students in SKLEC, including 125 Ph.D. students and 148 M.Sc. students.

学位授予
Degrees Offered

硕士学位：自然地理学；物理海洋学；海洋化学；海洋生物学；海洋地质；生态学；环境科学；港口、海岸及近海工程
M.Sc. Programs: Physical Geography; Physical Oceanography; Marine Chemistry; Marine Biology; Marine Geology; Ecology; Environmental Science; Port Coastal and Offshore Engineering

博士学位：自然地理学；河口海岸学；生态学；环境科学
Ph.D. Programs: Physical Geography; Estuarine and Coastal Science; Ecology; Environmental Science

入学新生与毕业学生
The Freshmen and Graduates

2016年实验室共招收研究生72人，其中博士生22人，硕士生50人，含留学生1人；招收的博士生中直博生8人、硕博连读2人。2016年共毕业48人，其中博士生12人，硕士生36人，陈恺、陈飞、丁文慧、胥维坤被评为2015年上海市优秀毕业生。
72 students were enrolled in 2016, including 22 Ph.D. and 50 M.Sc. students. 48 students graduated in 2016, including 12 Ph.D. and 36 M.Sc. students. CHEN Kai, CHEN Fei, DING Wenhui, XU Weikun were honored as Outstanding Graduate Student of Shanghai.

博士毕业生
List of Ph.D. Graduates

自然地理学/Physical Geography

姓名 Name	导师 Supervisor	毕业论文题目 Thesis	就业单位 Employment
张敏 ZHANG Min	周云轩 ZHOU Yunxuan	径-潮流作用下长江口能量季节性变化及河势稳定性研究 Seasonal variation of river and tide energy in Yangtze estuary and the influence on regime equilibrium	上海师范大学 Shanghai Normal University
岳伟 YUE Wei	陈中原 CHEN Zhongyuan	长江河口区晚新生代物源演化及其意义—来自流域特征重矿物的证据 The evolution of the Late Cenozoic sediment provenances of the Yangtze Estuary – the new evidence from the diagnostic heavy minerals of its drainage basin	同济大学 Tongji Universityi

河口海岸学/Estuarine and Coastal Science

姓名 Name	导师 Surpervisor	毕业论文题目 Thesis	就业单位 Employment
张林 ZHANG Lin	陈沈良 CHEN Shenliang	苏北废黄河三角洲海岸冲淤演变及其控制因素 The coastal erosion-deposition evolution and controlling factors of the abandoned Yellow River delta in northern Jiangsu province	上海精导科学仪器有限公司 Shanghai F-Nav Scientific Instrument Co., Ltd
赵恒 ZHAO Heng	周俊良 ZHOU Junliang	长江口典型药物残留的行为特征研究及监测方法优化 Environmental behavior of typical pharmaceutical residues in the Yangtze Estuary and optimization of monitoring technology	国家海洋局东海环境监测中心 East China Sea Environment Monitoring, SOA
王腾 WANG Teng	李道季 LI Daoji	台风对我国东部河口近海物质输运及水环境影响研究 Effects of typhoon on the material transport and water environment in the estuaries and adjacent sea of eastern China	国家海洋局东海环境监测中心 East China Sea Environment Monitoring, SOA
田清 TIAN Qing	杨世伦 YANG Shilun	近60年来气候变化和人类活动对黄河、长江、珠江水沙通量影响的研究 Impacts of climate change and human activity on the water and sediment flux of the Yellow, Yangtze and Pearl River basins over the past 60 years	南京信息工程大学 Nanjing University of Information Science & Technology
王锦龙 WANG Jinglong	杜金洲 DU Jinzhou	基于多参数示踪的东海泥沙输运研究 Using multi-tracers technique to understand the transport of sediment in the East China Sea	华东师范大学 East China Normal University

生态学/Ecology

姓名 Name	导师 Surpervisor	毕业论文题目 Thesis	就业单位 Employment
陈小华 CHEN Xiaohua	李小平 LI Xiaoping	富营养化初期湖泊(洱海)的环境演变及营养物基准/标准研究 Study on the recent 20-year eutrophication process and development of nutrient criteria/ standards of Lake Erhai at its initial stage of eutrophication	上海市环境科学研究院 Shanghai Academy of Environmental Sciences
闫白洋 YAN Baiyang	张利权 ZHANG Liquan	海平面上升叠加风暴潮影响下上海市社会经济脆弱性评价 Assessment of socio-economic vulnerability of the megacity of Shanghai to sea-level rise and associated storm surges	上海市行知中学 Shanghai Xingzhi High School
毛玉梅 MAO Yumei	李小平 LI Xiaoping	烟气脱硫石膏改良围垦滩涂盐碱土研究 Flue gas desulfurization gypsum improving saline-sodic soil in tidal flats	上海市农业学校 Shanghai College of Agriculture

姓名 Name	导师 Surpervisor	毕业论文题目 Thesis	就业单位 Employment
崔利芳 CUI Lifang	张利权 ZHANG Liquan	海平面上升影响下长江口滨海湿地脆弱性评价 Vulnerability assessment of the coastal wetlands in the Yangtze Estuary, China to sea-level rise	中国地质大学 China University of Geosciences
张天雨 ZHANG Tianyu	张利权 ZHANG Liquan	崇明东滩湿地沉积物有机碳和总氮储量动态研究 A study on the dynamics of sediment organic carbon and total nitrogen stocks at the Chongming Dongtan wetland	郑州大学 Zhengzhou University

硕士毕业生 List of M.Sc. Graduates

自然地理学/Physical Geography

姓名/Name	导师/Supervisor	姓名/Name	导师/Supervisor
NGUYEN THI THU HIEN	张卫国/ZHANG Weiguo	白雪莘/BAI Xuexin	张卫国/ZHANG Weiguo
曹文红/CAO Wenhong	陈静/CHEN Jing	陈晓东/CHEN Xiaodong	蒋雪中/JIANG Xuezhong
刘晋嫣/LIU Jinyan	张卫国/ZHANG Weiguo	刘伟苹/LIU Weiping	蒋雪中/JIANG Xuezhong
苗丽敏/MIAO Limin	杨世伦/YANG Shilun	王智罡/WANG Zhigang	李占海/LI Zhanhai
徐文晓/XU Wenxiao	程和琴/CHENG Heqin	杨宪平/YANG Xianping	李奥德/Leonid
朱强/ZHU Qiang	杨世伦/YANG Shilun	钱伟伟/QIAN Weiwei	周云轩/ZHOU Yunxuan
陆叶峰/LU Yefeng	杨世伦/YANG Shilun		

物理海洋学/Physical Oceanography

姓名/Name	导师/Supervisor
付元冲/FU Yuanchong	丁平兴/DING Pingxing

海洋化学/Marine Chemistry

姓名/Name	导师/Supervisor	姓名/Name	导师/Supervisor
卢珊/LU Shan	张芬芬/ZHANG Fenfen	周子然/ZHOU Ziran	邓兵/DENG Bing
刘丹彤/LIU Dantong	杜金洲/DU Jinzhou		

海洋地质/ Marine Geology

姓名/Name	导师/Supervisor	姓名/Name	导师/Supervisor
江俊/JIANG Jun	孙千里/SUN Qianli	喻薛凝/YU Xuening	王张华/WANG Zhanghua

生态学/Ecology

姓名/Name	导师/Supervisor	姓名/Name	导师/Supervisor
陈怀璞/CHEN Huaipu	张利权/ZHANG Liquan	丁文慧/DING Wenhui	李秀珍/LI Xiuzhen
黄俊/HUANG Jun	程金平/CHENG Jinping	林良羽/LIN Liangyu	童春富/TONG Chunfu

环境科学/Environmental Science

姓名/Name	导师/Supervisor	姓名/Name	导师/Supervisor
陈飞/CHEN Fei	侯立军/HOU Lijun	陈恺/CHEN Kai	周俊良/ZHOU Junliang
吴粒铰/WU Lijiao	施华宏/SHI Huahong	徐桂茹/XU Guiru	瞿建国/QU Jianguo
邓峰煜/DENG Fengyu	侯立军/HOU Lijun		

港口、海岸及近海工程/Port, Coastal and Offshore Engineering

姓名/Name	导师/Supervisor	姓名/Name	导师/Supervisor
戴苒/DAI Ran	朱建荣/ZHU Jianrong	郭超硕/GUO Chaoshuo	朱建荣/ZHU Jianrong
陆雪骏/LU Xuejun	程和琴/CHENG Heqin	邢超锋/XING Chaofeng	何青/HE Qing
胥维坤/XU Weikun	陈沈良/CHEN Shenliang	张晓鹤/ZHANG Xiaohe	李九发/LI Jiufa
周乐/ZHOU Le	陈沈良/CHEN Shenliang	吴宇帆/WU Yufan	朱建荣/ZHU Jianrong

公派留学
Oversea Study Supported by China Scholarship Council

2016年，实验室共有10位学生获公派留学资格，赴美国、英国、德国、荷兰攻读学位或接受联合培养。
Ten students supported by China Scholarship Council scholarships to study abroad (USA, UK, Germany and the Netherlands) for Ph.D. degrees to be offered either fully by oversea institutes or jointly with SKLEC.

博士研究生/Ph.D. Degree to be Offered by Oversea Institute

姓名 Name	申报国别/地区 Country/Region	留学单位 Oversea institute
张晓鹤/ZHANG Xiaohe	德国/Germany	波士顿大学/ Boston University

联合培养/Ph.D. Degree to be Offered Jointly with SKLEC

姓名 Name	国内导师 Supervisor	申报国别/地区 Country/Region	留学单位 Oversea institute
杜娟/DU Juan	杜金洲/DU Jinzhou	美国/USA	韦恩州立大学 Wayne State University
李佳娜/LI Jiana	施华宏/SHI Huahong	英国/UK	赫尔大学 University of Hull
郑树伟/ZHENG Shuwei	程和琴/CHENG heqin	美国/USA	路易斯安那州立大学 Louisiana State University
吴文挺/WU Wenting	周云轩/ZHOU Yunxuan	美国/USA	西北太平洋国家实验室 Pacific Northwest National Laboratory
邓智瑞/DENG Zhirui	何青/HE Qing	荷兰/the Netherlands	代尔夫特理工大学 Delft University of Technology
葛振鹏/GE Zhenpeng	戴志军/DAI Zhijun	瑞典/Sweden	隆德大学 Lund University
李翔宇/LI Xiangyu	朱建荣/ZHU Jianrong	美国/USA	伍兹霍尔海洋研究所 Woods Hole Oceanographic Institution
宋淑贞/SONG Shuzhen	李道季/LI Daoji	美国/USA	伍兹霍尔海洋研究所 Woods Hole Oceanographic Institution
朱正涛/ZHU Zhengtao	陈沈良/CHEN Shenliang	美国/USA	南弗罗里达大学 University of South Florida

海外研修
Oversea Visiting

2016年，实验室有3位同学赴美国、荷兰、澳大利亚进行交流访学。
Three students went abroad (USA, the Netherlands, and Australia) as visiting students.

姓名/Name	访学单位/Visiting institute	起止时间/Date
白雪莘 BAI Xuexin	悉尼大学 University of Sydney	2015.08-2016.02
潘燕群 PAN Yanqun	特温特大学 University of Twente	2015.10-2016.09
黄文杰 HUANG Wenjie	印第安纳大学 Indiana University	2016.07-2016.09

研究生科研成果
Research Outputs Contributed by Graduate Students

2016年研究生发表第一作者论文78篇，占实验室第一作者论文总数的67%，其中SCI/SCIE论文47篇（I区文章2篇，II区16篇），占实验室SCI/SCIE论文的51%。实验室学生中有12人次参加国际学术会议，其中5人做口头报告。
The graduate students published 78 papers as first authors, among which 47 papers were published in SCI/SCIE journals. Twelve (12) students attended international conferences with 5 oral presentations.

2016年7月，经上海市教育委员会、上海市学位委员会审核，我室2014届河口海岸学博士生裘诚学位论文“长江河口盐水入侵对气候变化和重大工程的响应”和2014届环境科学硕士生史晓东学位论文”利用被动采样方法研究药物和内分泌干扰物的河口环境行为”入选2015年上海市研究生优秀成果（学位论文）。
The doctor dissertation “The responses of saltwater intrusion to climate change and major projects in the Changjiang River estuary”, submitted by QIU Cheng, who graduated in 2014, and the master dissertation “Research on the estuarine behavior of pharmaceuticals and endocrine disruptors using passive sampling”, submitted by SHI Xiaodong, were awarded the Outstanding Dissertation of Shanghai Graduate Students by Shanghai Municipal Education Commission and Academic Degree Committee of Shanghai in July.

公众服务
Outreaches

为促进优秀大学生之间的思想交流，扩大河口海岸学国家重点实验室在国内相关院校中的影响力，提高实验室研究生生源质量，由我校研究生院主办、河口海岸学国家重点实验室承办的“2016年河口海岸学优秀大学生夏令营”于2016年7月11日至14日在我校举行。通过高校推荐和河口海岸学国家重点实验室的选拔，共有来自国内二十多所高校的34名大学生参加本次夏令营。
Under the guidance of East China Normal University, SKLEC hosted Excellent Students’ Summer School of Estuarine and Coastal Science during July 11-14, 2016. According to recommendation from universities and SKLEC’s selection, finally, there were 34 excellent students that participated in the programme.

2016年5月21日，实验室开展了主题为“蓝色海洋，绿色世界”的公众开放日活动，活动吸引了100多位公众参与，包括大学教师、在校学生、工人、公司白领等。
On 21st May, 2016, the SKLEC Public Open Day attracted more than 100 visitors including university teachers, students and workers.

2016年7月13日，全国青少年高校科学营华东师范大学分营来自全国各地的100多名高中生、带队教师和志愿者参观了河口海岸学国家重点实验室。我室杜金洲教授、吴辉教授和研究生陈小刚、唐亮、陈威为营员们讲解了我室的发展历史及对国家和地方做出的贡献，介绍了相关的学科知识。
Members of the National Youth Science Camp, consisting of more than 110 high school students, teachers, and volunteers visited SKLEC on 13th July, 2016. Prof. DU Jinzhou, Prof. WU Hui, CHEN Xiaogang, TANG liang and CHEN Wei introduced some information about SKLEC.

学位评定分委员会

主　任：高抒
副主任：何青、张卫国
委　员：丁平兴、戴志军、杜金洲、李道季、李秀珍、沈芳、周云轩

SKLEC Committee for Academic Degree Assessment

Chair: GAO Shu
Deputy Chair: HE Qing, ZHANG Weiguo
Members: DING Pingxing, DAI Zhijun, DU Jinzhou, LI Daoji, LI Xiuzhen, SHEN Fang, ZHOU Yunxuan

研究队伍
Research Staff

研究队伍
Research Staff

2016年，重点实验室引进研究人员2人，现有固定人员60人（其中研究人员51人，技术人员7人，管理人员2人）。
Two faculty members joined SKLEC in 2016. There are 60 fulltime members in SKLEC, including 51 academic research members, 7 technical members and 2 administrative members.

固定人员
Faculty and Staff

教授 Professors

姓名 Name	研究专长 Research Interests	Email
陈吉余 院士 Mr. CHEN Jiyu Academician of CAE	河口海岸 Estuarine and Coastal Research	jychen@sklec.ecnu.edu.cn
陈庆强 Mr. CHEN Qingqiang	海洋沉积学；环境与生物地球化学 Marine Sedimentology; Environmental Geochemistry & Biogeochemistry	qqchen@sklec.ecnu.edu.cn
陈沈良 Mr. CHEN Shenliang	海岸动力地貌；三角洲侵蚀与脆弱性 Coastal Morphodynamics; Delta Erosion and Vulnerability	slchen@sklec.ecnu.edu.cn
陈中原 Mr. CHEN Zhongyuan	河流-三角洲沉积地貌过程；水文地貌过程；环境考古 River-Delta Sedimentological and Geomorphological Processes; Geoarchaeology	z.chen@sklec.ecnu.edu.cn
程和琴 Ms. CHENG Heqin	河口海岸动力沉积学；工程地貌与环境；海岸带管理 Estuarine and Coastal Dynamic Sedimentation; Engineered Morphodynamics and Environment; Integrated Coastal Management	hqch@sklec.ecnu.edu.cn
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	IAG-Large Rivers Working Group	Member	2001-
	Earth Surface Processes and Landforms	Editorial advisory board	2008-
	Geomorphology	Editorial board member	2001-
	Estuarine Coastal and Shelf Science	Associate Editor	2013.1-
程和琴 CHENG Heqin	Journal of Geology, Geophysics and Geosystems	Editorial board member	2009-
程金平 CHENG Jinping	Bulletin of Environmental Contamination and Toxicology	Editorial board member	2013.1-
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	China Ocean Engineering	Editorial board member	1999-
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	Marine Life Sciences	Editorial board member	2013.4.15-
	Biological Segment	Technical editor	2014-
何青 HE Qing	INTERCOH	SSC Member	2003-
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	American Journal of Environmental Monitoring	Editorial board member	2014.8-
	Earth Sciences	Editorial board member	2014.9-
	Scientific Reports	Editorial board member	2015.12-
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	Ocean and Coastal Management	Associate Editor	2014.10-
	Journal of Conservation Planning	Editorial board member	2001-
	Ecological Engineering	Editorial board member	2008.8-
	Chinese Geographical Science	Editorial board member	2009.6-
	Wetlands Ecology and Management	Editorial board member	2012.8-
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