河口海岸学国家重点实验室
（华东师范大学）
State Key Laboratory of Estuarine and Coastal Research
(East China Normal University)



2013年度报告 / ANNUAL REPORT

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2013 年度报告
ANNUAL REPORT

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CAS – Chinese Academy of Sciences
CAE – Chinese Academy of Engineering
SOA – State Oceanic Administration of China
CAFS – Chinese Academy of Fishery Sciences
MLR – Ministry of Land and Resources

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2013年度报告
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实验室简介
SKLEC Introduction

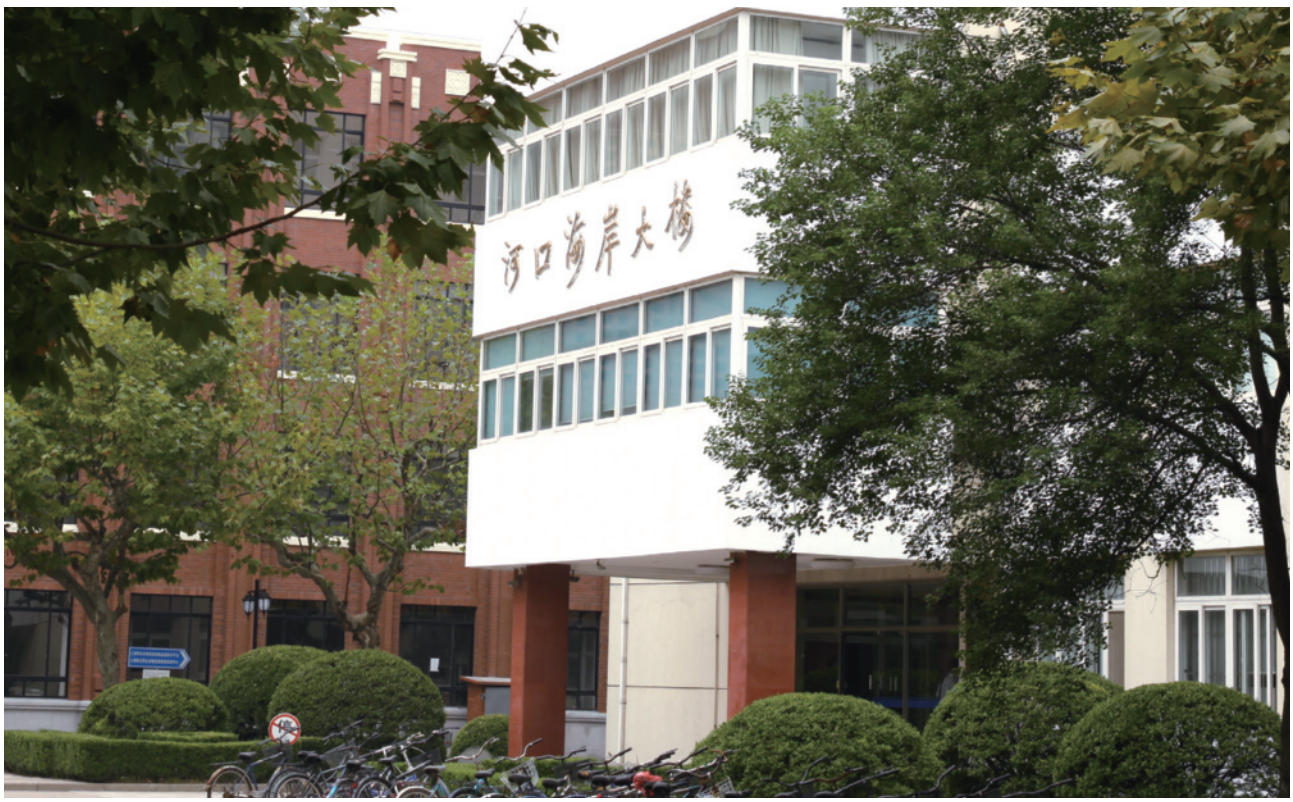
河口海岸学国家重点实验室缘自1957年由教育部批复建立的华东师范大学河口研究室，依托华东师范大学，于1989年由原国家计委批准筹建，1995年12月通过国家验收并正式向国内外开放。

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57人，其中研究人员48人(教授28人，副教授10人，讲师10人；具有博士学位的44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 on the basis of estuarine and coastal research in East China Normal University (ECNU) since 1957. It was set up by the formerly State Planning Commission of China in 1989, and went into operation in December 1995. It is now co-sponsored by 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 57 fulltime faculties and staff members in the laboratory, which include 48 research faculties (28 professors, 10 associate professors, and 10 lecturers, among them 44 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.



概述
Summary

实验室围绕河口演变规律与河口沉积动力学、海岸动力地貌与动力沉积过程、河口海岸生态与环境三个研究方向，承担了973、科技部全球变化研究重大专项、科技部基础专项和国家自然科学基金重点项目等课题160多项，开展了河口海岸地区的物理过程、化学过程、生物过程和地质过程综合研究，揭示全球气候变化与人类活动对河口海岸区域的影响。在泥沙运动、河口动力沉积地貌过程、三角洲全新世海平面变化、海岸及近海光学遥感基础研究、河口污染、河口湿地生态系统等方面，取得了显著进步，发表学术论文160多篇，其中SCI论文90篇，包括一区、二区论文27篇；在国际期刊主编专辑4期，出版专著5册、中文教材1册；研究成果获得省部级奖励1项。

SKLEC is dedicated to the research on 1) Estuarine evolution and sedimentation dynamics, 2) Coastal morphodynamics and sedimentary process, and 3) Ecology and environment in costal and estuarine areas. It emphasizes integrated study of physical, geochemical, biological and geological processes in estuarine and coastal regions, and its response to global climate change and human activities. More than 160 projects were ongoing, including National Basic Research Programme of China (973), Ministry of Science and Technology (MOST) Global Change Study Programme, and Key Project of National Natural Science Foundation of China (NSFC). Research progresses include, but not limited to, sediment transport, morphodynamics and sedimentation dynamics in estuary, Holocene sea-level change, fundmental study of coatal and marginal sea remote sensing, pollution in estuarine waters, coastal wetland ecosystem. More than 160 peer-reviewed papers were published, among which 90 were published in international journals. Four special issues in international journals and 5 books were edited or authored by SKLEC faculties. SKLEC received one award from Shanghai Municipality for its outstanding performance in research.

实验室主、承办了国际河口海岸科学协会第53届大会(ECSA53)、973资环领域“中国河口海岸和近海研究战略研讨会”等重要的国内外学术会议。与国际“海洋生物地球化学与生态系统的整合研究”(IMBER)计划续签区域项目办公室(IMBER RPO)备忘录(2014-2016)，与美国西北太平洋国家实验室(PNNL)海洋实验室(MSL)签署了以河口海岸以及近海海洋为主要合作内容的合作备忘录。获批国家自然科学基金委员会国际(地区)合作与交流重大项目1项。

A number of international/national academic meetings were hosted by SKLEC, including the 53th Conference of Estuarine and Coastal Science Association (ECSA53) together with Elsevier, and the workshop on Research Strategy for Estuary, Coast and Sea in China supported by MOST 973 progamme. The MoU on Regional Project Office (RPO) between the Integrated Marine Biogeochemistry and Ecosystem Research (IMBER) project and East China Normal University (ECNU) was extended (2014-2016). The MoU between the Marine Science Laboratory (MSL) of Pacific Northwest National Laboratory (PNNL) and SKLEC was signed for cooperation in the field of estuarine and coastal studies. One key project of international cooperation and exchange was granted by NSFC of China.

在研究生教育上，实验室聘请国际知名教授开设了全英文授课的“高级河口海岸研究”(AECS)课程。自2014年起首次试行申请考核入学的方式招收博士研究生。1篇博士学位论文入选2012年上海市研究生优秀成果。

SKLEC provides for the first time the course Advanced Estuarine and Coastal Research (AECS) taught in English, which was lectured by well known international scholars in 2013. SKLEC introduces a new Ph.D. student admission scheme, in which overall performance of a Ph.D. student applicant is the key factor to be considered for admission rather than high scores from paper examination. One Ph.D. dissertation was awarded the Outstanding Dissertation of Shanghai Graduate Students.

陈吉余教授获得国际河口海岸科学协会(ECSA)授予的“终身成就奖”。沈健教授入选“上海千人计划”，侯立军教授获国家自然科学基金委员会优秀青年科学基金计划支持，侯立军、王张华教授入选教育部新世纪优秀人才支持计划。

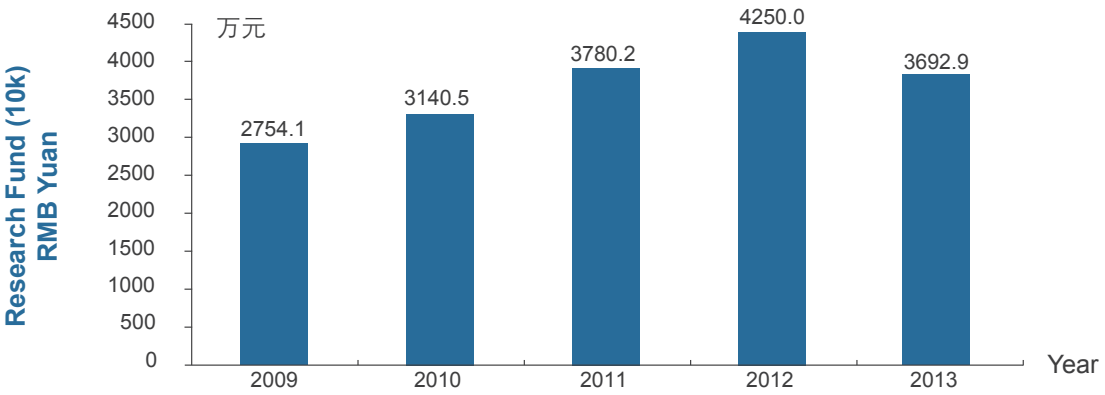
Prof. Chen Jiyu was honored the Lifetime Achievement Award by the Estuarine and Coastal Science Association (ECSA). Prof. Shen Jian was funded by the Shanghai Recruitment Program of Global Experts (also named Thousand Talents Program of Shanghai). Prof. Hou Lijun was awarded the NSFC Young Scientist Fund, and Prof. Hou Lijun and Wang Zhanghua the Ministry of Education (MOE) New Century Excellent Talent Program.

科研课题与进展
Research Programs and Highlights

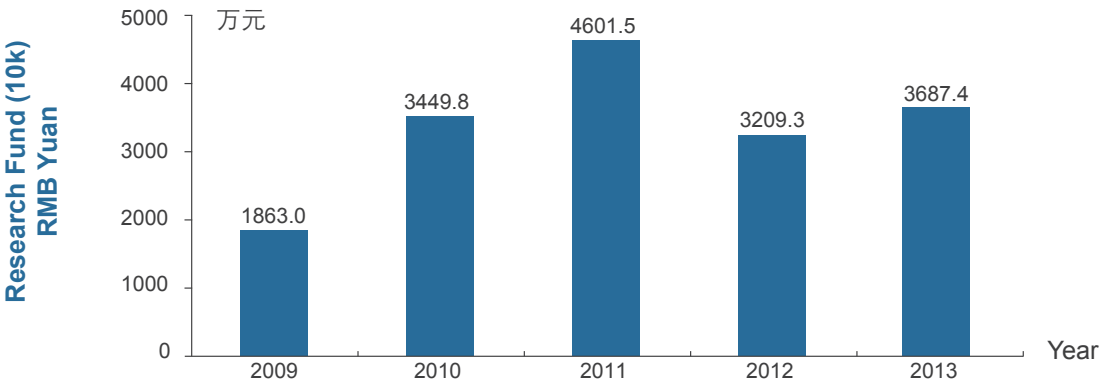
科研课题
Research Programs

2013年度，实验室新增项目约60项，新增合同经费3212.43万元。其中，国家、省部级项目新增30余项，合同经费2566.4万元。此外，实验室还获得科技部国家重点实验室专项经费1225万元，其中475万元用于自主研究课题的部署，380万元用于实验室管理运行和开放课题，370万元用于仪器设备更新；获得985仪器设备经费530万元；获得教育部和国家外专局“111计划”资助“河口海岸水安全创新引智基地”180万元。

Sixty new projects were granted in 2013 with a total fund of 32.12 million RMB. Among them, more than 30 projects were awarded from national or provincial funding agencies, which total 25.66 million RMB. In addition, SKLEC received special funding from the Ministry of Science and Technology (MOST) of China, among which 4.75 million RMB was targeted at scientific research, 3.8 million RMB for administration and operation of SKLEC, and 3.7 million RMB for equipment and infrastructure construction. SKLEC also received equipment and infrastructure funding (5.3 million RMB) through the scheme of ECNU “985” project. The “111 Project” “Sustainability of Water Resources in Estuarine and Coastal Environment” received 1.8 million RMB from the Ministry of Education (MOE) and the State Administration for Foreign Expert Affairs (SAFEA) of China.



2009-2013 年实到科研经费
Competitive Research Fund Received in 2009-2013



2009-2013 年新增合同经费
Contracted Competitive Research Funding in 2009-2013

新增重大项目简介
Brief Introduction of Selected New Project

科技部科技基础性工作专项重点项目：中国典型河口动力沉积地貌本底数据调查(2013FY112000)
Key Project of MOST Fundamental Project Special Fund: Hydrodynamic, Sedimentological and Geomorphological Survey of Typical Estuaries in China (2013.06-2018.05)

项目由华东师范大学、中国海洋大学、中国科学院地理科学与资源研究所、中山大学和珠江水利委员会珠江水利科学研究院共同承担。本项目拟选取我国长江、黄河和珠江河口为典型研究区域，开展河口动力沉积地貌综合调查，获取当前流域水沙变化和河口强烈人类活动影响下的河口沉积动力过程及地貌响应的综合基础数据，为河口区域的防灾减灾、资源开发利用以及社会与自然和谐发展提供重要支撑。

This project was carried out jointly by East China Normal University, Ocean University of China, Institute of Geographic Sciences and Natural Resources Research of CAS, Sun Yat-Sen University, and Research Institute of Water Resources, Pearl River Water Resources Commission of the Ministry of Water Resources. Taking the estuaries of the three largest rivers in China, i.e., the Yangtze River, the Yellow River the Pearl River, as the study areas, this project aims to carry out integrated hydrodynamic, sedimentological and geomorphological survey in the context of current fluvial sediment and water discharge changes and intensive human activites within the estuarine areas. The obtained baseline data will provide scientific support for disaster prevention and mitigation, resources utilization and sustainable development of estuarine regions.

部分新增项目
Selected New Projects

科技部科技基础性工作专项重点项目 Key Project of MOST Fundamental Project Special Fund	
中国典型河口动力沉积地貌本底数据调查(2013FY112000) Hydrodynamic, sedimentological and geomorphological survey of typical estuaries in China (2013.06-2018.05)	张卫国 Zhang Weiguo
国家自然科学基金面上项目 NSFC General Project	
三苯基锡和维甲酸X受体抑制剂(UVI3003)对热带爪蟾胚胎致畸机制的比较研究(21277049) Comparative studies of teratogenic mechanisms induced in Xenopus tropicalis embryos by triphenyltin and an antagonist of retinoid X receptor (UVI3003) (2013.01-2016.12)	施华宏 Shi Huahong
长江口潮滩湿地C、N汇聚能力时空分异及影响因素(41271065) Spatial-temporal distribution and influencing factors for carbon and nitrogen sequestration at the Yangtze Estuary (2013.01-2016.12)	李秀珍 Li Xiuzhen
河口潮滩湿地厌氧氨氧化及其环境调控机理研究(41271114) Anaerobic ammonia oxidation of tidal flat wetland and its environmental regulation mechanism (2013.01-2016.12)	侯立军 Hou Lijun
近两千年来长江三角洲沉积物物源及黄河南迁的影响(41271223) Sediment provenance of the Yangtze Delta in the last 2000 years and the possible influence of the Yellow River (2013.01-2016.12)	张卫国 Zhang Weiguo
近岸浑浊富沙水体叶绿素浓度的遥感反演方法及光学机理(41271375) Optical mechanism and algorithms for remote estimation of chlorophyll-*a* concentration in turbid sediment-laden coastal waters (2013.01-2016.12)	沈芳 Shen Fang

水库化对长江流域与河口重金属污染形态与季节分配的影响(41271519) The impact of dam construction on heavy metals flux and seasonal fluctuation in Changjiang River and its estuary (2013.01-2016.12)	邓兵 Deng Bing
长江中下游典型大坝水库泥沙淤积过程中溶解硅滞留行为探究(41271520) Dissolved silicate retention behavior in the process of reservoir sediment deposition in the middle and lower reaches of the Yangtze River (2013.01-2016.12)	李茂田 Li Maotian
洞庭湖地区全新世气候特征、湖面波动与人类迁移的耦合研究(41272194) Study on the Holocene climate, lake level changes and human migration in Lake Dongting catchment (2013.01-2016.12)	孙千里 Sun Qianli
河口泥沙输运在自然和人类驱动下的响应和源汇转化研究(41276080) Estuarine sediment transport and source to sink transformation in response to natural processes and human activities (2013.01-2016.12)	何青 He Qing
陆源溶解有机碳的迁移转化及其生态环境效应-以长江口为例(41276081) Transport and transform of dissolved terrigenous organic carbon and its eco-environmental impact: take the Yangtze Estuary as the example (2013.01-2016.12)	吴莹 Wu Ying
国家自然科学基金青年科学基金项目 NSFC Young Scientists Fund	
中国海域海蛄虾类分类与动物地理学研究(31201704) Study on the taxonomy and zoogeograph of the thalassinid (Crustacea: Decapoda) of China seas (2013.01-2015.12)	刘文亮 Liu Wenliang
基于植物生理生态过程-遥感耦合模型的长江口湿地植被生产力动态研究(41201091) Research on dynamics of vegetation productivity in the Yangtze River Estuary wetlands based on coupled model of physio-ecological processes of plants and remote sensing (2013.01-2015.12)	葛振鸣 Ge Zhenming
重金属和虫害胁迫下红树的抗性适应及外源茉莉酸酮脂的调控(41201525) Resistance of mangrove to stresses of heavy metal and insect damage and regulations of exogenous jasmonates (2013.01-2015.12)	闫中正 Yan Zhongzheng
低纬度小河流流域盆地新鲜有机质入海定量化研究(41206065) An quantitative study of the fresh organic matter exported by small rivers in low latitude region (2013.01-2015.12)	朱卓毅 Zhu Zhuoyi
国际合作项目 International Cooperation Project	
自然与人类活动对俄罗斯远东和中国的河口生物地球化学过程的影响对比(国家自然科学基金国际(地区)合作交流项目)(41311120066) Influence of natural and anthropogenic factors on the biogeochemical processes in estuaries of Russian Far East and China: Comparative analysis (NSFC Fund for International Cooperation and Exchange) (2013.01-2014.12)	张经 Zhang Jing
省部级项目 Project Funded by Provincial and Ministerial Commission	
东滩湿地演变对生态治理工程的响应与生态修复技术集成示范(上海市科委重点项目)(13231203500) Response of Dongtan wetland to ecological engineering works and integrated ecological restoration technology (Science and Technology Commission of Shanghai Municipal Government Key Project) (2013.09-2015.08)	周云轩 Zhou Yunxuan
基于辐射传输模型的浑浊海岸水色参数的遥感反演研究(高等学校博士学科点专项科研基金)(20120076110009) Remote sensing retrievals of ocean color parameters in highly turbid waters based on radiative transfer models (Specialize Research Fund for the Doctoral Program of Higher Education of China) (2013.01-2015.12)	沈芳 Shen Fang

潮间带光滩水流结构对悬移质分布和微地貌演变的影响研究(高等学校博士学科点专项科研基金)(20120076120020) The effect of flow structure on the distribution of suspended sediment and the evolution of micromorphology in tidal mud flat (Specialize Research Fund for the Doctoral Program of Higher Education of China) (2013.01-2015.12)	王宪业 Wang Xianye
多过程建模技术在研究海岸带湿地固碳潜力及气候变化影响中的应用(上海市浦江人才计划)(13PJ1402200) The application of multi-progress modeling in carbon sequestration potentials in coastal wetlands and the effect of climate change (Shanghai Pujiang Talent Plan) (2013.09-2015.08)	葛振鸣 Ge Zhenming

科技部实验室专项基金
MOST Special Fund

2013年，科技部实验室专项共资助研究团队自主课题7项、人才队伍课题2项、技术开发项目7项。
Laboratory special fund, supported by the Ministry of Science and Technology (MOST) of China, granted seven research cluster projects, two projects for faculties, and seven for technical faculties.

各团队自主课题经费额度为150万元，分3年执行(2012年-2014年)。2013年，各团队研究的主要内容为：长江三角洲初始发育及其对海平面变化的响应、海洋光学应用基础研究——以反射率、漫衰减系数的理论近似关系为例、长江口滨海盐沼植被格局和碳过程时空动态及其形成机制研究、近岸河口水域新型污染物的环境行为、复合污染及生态效应、黑角珊瑚的高分辨地球化学记录及其对南海150年来环境变化的反演、三角洲岸滩动力-沉积-地貌过程的耦合机制、航道泥沙回淤机制研究。
Each research cluster was granted a three-year (2012-2014) project with a total of 1.5 million RMB. In 2013, the research contents carried out by the research clusters include: 1) Initialization of the Yangtze River delta and its response to sea level change; 2) Ocean optics application basis: cases studies on theoretical approximations of diffuse reflectance and diffuse transmittance; 3) Study on spatio - temporal dynamics of coastal saltmarsh pattern and carbon accumulation in the Yangtze Estuary and its formation mechanism; 4) Emerging pollutants in the Yangtze River Estuary and coastal region: Environmental behavior, combined pollution and ecotoxicological study; 5) High resolution geochemical records in black corals of the South China Sea and implication for environmental changes in the 150 years; 6) Coupling mechanism of hydrodynamic, sedimentary and geomorphic processes in deltaic coast; 7) Sediment siltation in navigation channel and its mechanisms.

专项基金自主课题资助一览表
List of Projects Granted to Research Clusters (2012-2014)

项目名称 Project	研究团队 Research Cluster
长江流域-三角洲全新世环境演化：人与自然互动 Holocene Evolution of the Yangtze River Basin-Delta: Interaction of Human and Environment	沉积环境演变研究中心 Center for Paleoenvironmental Change
河口海岸水域光学/微波特性研究-以悬浮泥沙及水下地形遥感应用为例 Optical and Microwave Characteristic of Estuarine and Coastal Waters: Remote Sensing Application on Suspended Sediment and Underwater Topography as Examples	遥感与地理信息研究中心 Center for Remote Sensing and Geoinformatics
长江口湿地碳源/汇稳定性对气候变化的响应及适应性调控策略研究 Response of Carbon Source/Sink Stability of the Yangtze Estuary Wetland to Climate Change and Its Adaptive Adjusting Strategies	湿地生态研究中心 Center for Coastal Wetland Ecosystems

近岸河口新型有机污染物的环境行为及复合污染效应 New Emerging Pollutants in the Yangtze River Estuary and Coastal Region: Environmental Behavior and Combined Pollution	水环境研究中心 Center for Aqua Environment
海南东部潟湖物质通量特征及其对毗邻生态环境的影响 Material Flux Character of Lagoon in the East of Hainan Province and Its Effect on Adjacent Ecological Environment	化学海洋学与生物地球化学研究中心 Center for Chemical Oceanography and Biogeochemistry
大河三角洲沉积动力与地貌动力耦合理论及应用研究 Coupling Theory of Sediment Dynamic and Morphodynamic of Large-Scale Estuarine and Its Application	动力地貌与沉积研究中心 Center for Morphodynamics and Sedimentation
河口海岸水沙运动对自然和人类驱动的响应机制 Estuarine and Coastal Hydrodynamics and Sediment Dynamics in Response to Natural Processes and Human Activities	水沙动力学及工程应用研究中心 Center for Hydro-Sediment Dynamics and Coastal Engineering

专项基金人才队伍课题资助一览表
List of Recipients of Special Fund for Research Faculties

项目名称 Project	负责人 Investigator
中俄界河阿莫尔河到鞑靼海峡联合航次和生物地球化学研究 Joint Cruise from Amor River to Tatar Strait and Biogeochemical Research	张经 Zhang Jing
长江入海物质在闽浙海域的输送动力机制及其生态效应研究 Transport Mechanisms and Ecological Effects of the Changjiang-Derived Materials in the Min-Zhe Coastal Waters	吴辉 Wu Hui

专项基金技术开发课题资助一览表
List of Recipients of Special Fund for Technology Development

项目名称 Project	负责人 Investigator
生物碳酸盐类样品中硫同位素分析技术及其应用研究 Sulfur Isotopic Compositions in Biogenic Carbonates: Analysis and Application	瞿建国 Qu Jianguo
ABS标定系统研制与实验研究 Development of ABS Calibration System	张文祥 Zhang Wenxiang
河口海岸野外观测平台组网技术研究 Key Technique for Field Observation Network in the Yangtze River Estuary	顾靖华 Gu Jinghua
低含量样品的氮稳定同位素分析 Nitrogen Stable Isotope Analysis of Low-Level Samples	张国森 Zhang Guosen
单分子脂肪酸碳同位素检测方法的优化－分离度改善和氧化效率评估 Optimization of Analysis Method on Stable Carbon Isotope of Specific Fatty Acids-Resolution Improvement and Oxidation Efficiency Evaluation	崔莹 Cui Ying
利用MC-ICP-MS对Li、Fe、Sr、Nd、Hf、Pb、Tl、U、Si、Se的实验室同位素标准建立及酸空白测定 Establishment of Inner Isotope Standards for Li, Fe, Sr, Nd, Hf, Pb, Tl, U, Si, Se and Acid Blank Determination Using MC-ICP-MS	薛云 Xue Yun
实验室综合信息管理系统 Integrated Laboratory Management Platform	袁庆 Yuan Qing

研究进展
Research Highlights

2013年，实验室在河口研究方面，围绕大型水库对河口盐水入侵、最大浑浊带发育和河口地貌的影响、河口悬沙运动的遥感分析以及放射性核素示踪、细颗粒泥沙粒度特征对沉积固结的影响、河口-陆架的动力学集成模型开发、河口盐沼氨氧化细菌与氮循环、生物新物种鉴定等主题开展了深入研究；在海岸研究方面，围绕长江三角洲早-中全新世海平面变化及地貌发育、长江冲淡水沿岸输运的定量计算、沿岸地下水排放对近海影响、放射性核素对营养盐输运的示踪、长江和尼罗河三角洲滨海沉积物重金属污染等方面开展了深入研究；在生态环境方面，围绕热带中小河流河口碳循环、地下水排放的同位素检测、亚洲地区海水Ra同位素分析比对、河口水体抗生素分布、风险评价及检测方法、生态毒理、生态过程模拟、土地利用强度对围垦湿地养分影响等开展了深入研究。
In 2013, in the field of estuarine study, the following topics were focused on: impact of dam on estuarine saltwater intrusion, turbidity maximum zone and geomorphology, tracing suspended sediment transport using remote sensing and radionuclides, influence of granular properties on sediment consolidation in silt-rich system, integrated estuary-shelf dynamic modelling, ammonia-oxidizing bacteria and N cycle in salt marsh, new species identification. In the field of coastal study, the topics were: early-middle Holocene sea-level changes and the initiation of the Yangtze Delta, detiding measurement on transport of the Changjiang-derived buoyant coastal current, coastal submarine groundwater discharge and its impact on offshore water, radionuclide tracing of nutrients in coastal water, heavy metal pollution in coastal sediments of the Yangtze River and Nile River deltas. In the field of ecological and environmental study, the following areas are focused on: carbon cycle in small tropical estuaries, radionuclide detection of submarine groundwater discharge, inter-comparison of radium analysis in coastal sea water of the Asian region, antibiotics in the surface water of the Yangtze Estuary and risk assessment, matrix effect in high-performance liquid chromatography-tandem mass spectrometry analysis of antibiotics in environmental water samples, ecotoxicology, ecological modelling, effects of land use intensity on wetland soil nutrient distribution after reclamation.

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。实验室受上海市野生动植物保护站委托，开展上海市湿地资源的调查、湿地数据库建立、国家与国际重要湿地的确认与标识；受上海市地质调查研究院委托，开展长江三角洲南部第四纪磁性地层、物源演化与地质环境演化模式研究；受上海市水文总站委托，编制长江口年报；受上海城投原水有限公司委托，开展陈行水库污染状况分析；受上海市海洋管理事务中心委托，开展海洋灾害事故统计、调查和评估等。
In addition, SKLEC was actively involved in the studies aiming at providing support for government decision making, solving key scientific and technological issues related to local and national economic and social sustainable development. Funded by Shanghai Wild Animal and Plant Protection Station, wetland resources in Shanghai were investigated, wetland database developed, and national and international important wetlands identified. Commissioned by Shanghai Institute of Geological Survey, Quaternary magnetostratigraphy, sediment provenance and geological evolution of the southern Yangtze Delta were studied. Supported by Hydrological Station of Shanghai, annual report of the Yangtze Estuary was edited. Commissioned by Shanghai Chengtou Raw Water Co., Ltd., pollution status of Chenhang Reservoir was investigated. Funded by Ocean Management Center of Shanghai, the statistical analysis, investigation and assessment of marine disasters were carried out.

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

Three-dimensional gravity-current flow within a subaqueous bend: Spatial evolution and force balance variations.
Wei, T.Y., Peakall, J., Parsons, D.R., Chen, Z.Y., Zhao, B.C., Best, J., ***Sedimentology,*** 2013, 60(7): 1680-1688.

The nature of three-dimensional flow in submarine channel bends is poorlyunderstood, largely due to the absence of detailed data from natural channels. Herein, data from density-driven flows in a large reservoir on theHuanghe (Yellow) River are presented showing the spatio-temporal variationof flow around a subaqueous bend. The data demonstrate for the first time that reversed helical flow, relative to that found in river channel bends, can occur from the centrifugal forcing of flow, even when the Coriolis force acts in the opposite direction. The data also suggest that reversed helical flowfields in submarine channels may be more frequent than currently estimated, notably for bends where Coriolis and centrifugal forces combine in the samedirection. In addition, this study provides the first field evidence suggestingthat sinuous submarine channels can exhibit an asymmetry in helical floworientation between left and right-turning bends, which will have major implications for the morphodynamics of submarine channels, their resultant patterns of sedimentation and, ultimately, the distribution of depositional units across submarine fan systems.

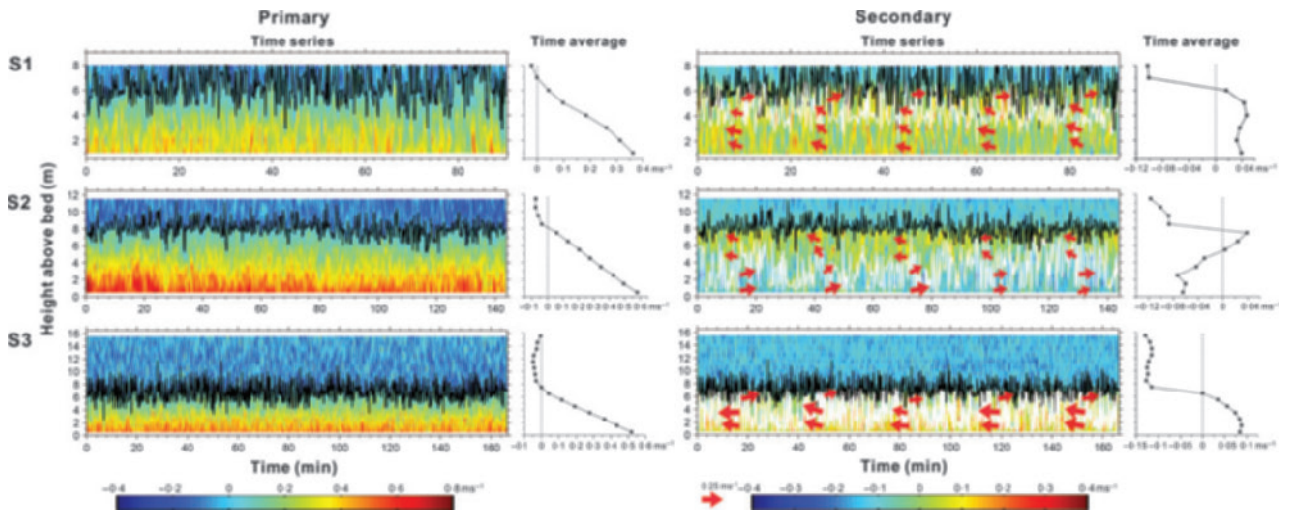


Fig. 3. Temporal records of ADCP-derived downstream and cross-stream flow velocities for the three at-a-point stations (S1 to S3; see Fig.1 for locations), along with time-averaged velocity profiles. Secondary flows in the colour plots are uncorrected, whilst the arrows show velocity vectors corrected using the Rozovskii rotation method (Rozovskii, 1957). Downstream and inwardly orientated flows are positive, with the zero velocity isolines shown by thick black lines. No secondary flow correction has been applied to the ambient fluid above the gravity current. Corrected secondary flow vectors are consistent between subplots (see legend). Note that different depth scales are used in each subplot, and separate colour scales are used for downstream and cross-stream flow. Time-averaged velocity profiles consist of corrected (rotated) data within the gravity current, with uncorrected data in the overlying ambient fluid. ADCP, Acoustic Doppler Current Profiler.

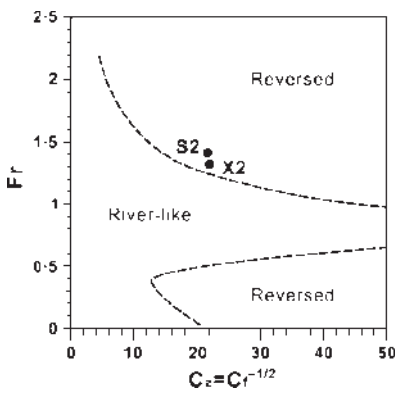


Fig. 4. Data from the Xiaolangdi subaqueous bend plotted on the phase-space of river-like and reversed secondary circulation as predicted from the analysis of Abad *et al.* (2011). The plot shows densimetric Froude number (Fr) versus the Chezy resistance coefficien (Cz). S2 and X2 refer to the at-a-point and cross-section data at the bend apex, respectively, and are seen to just plot within the reversed flow field.

Diversity, abundance, and activity of ammonia-oxidizing bacteria and archaea in Chongming eastern intertidal sediments.

Zheng, Y.L., Hou, L.J., Liu, M., Lu, M., Zhao, H.,Yin, G.Y., Zhou, J.L., ***Applied Microbiology and Biotechnology,*** 2013, 97 (18): 8351-8363.

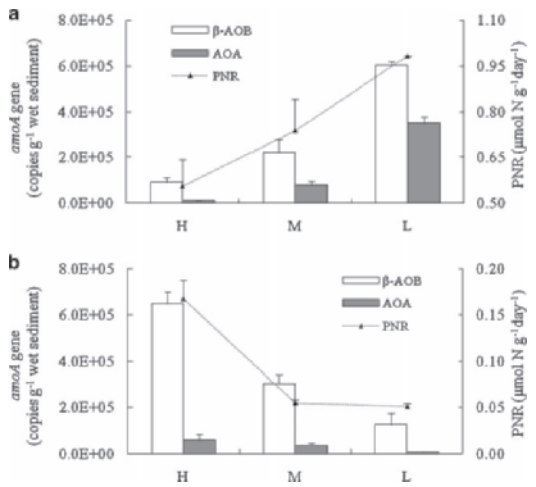


Fig. 4. β-Proteobacterial and archaeal *amoA* gene copy numbers and the potential nitrification rates (PNR) in summer (a) and winter (b). The *error bars* of *amoA* copy numbers are standard deviations of triplicate real-time PCR assays while the *error bars* of potential nitrification rates are standard deviations of triplicate incubations

Ammonia oxidation plays a pivotal role in the cycling and removal of nitrogen in aquatic sediments. Certain bacterial groups and a novel group of archaea, which is affiliated with the novel phylum *Thaumarchaeota*, canperform this initial nitrification step. We examined the diversityand abundance of ammonia-oxidizing β-Proteobacteria (β-AOB) and ammonia-oxidizing archaea (AOA) in the sediments of Chongming eastern tidal flat using the ammonia monooxygenase-α subunit (*amoA*) gene as functional markers. Clone library analysis showed that AOA had ahigher diversity of amoA gene than β-AOB. The β-Proteobacterial *amoA* community composition correlated significantly with water soluble salts in the sediments, where as the archaeal *amoA* community composition was correlated more with nitrate concentrations. Quantitative PCR (qPCR) results indicated that the abundance of β-AOB *amoA* gene (9.11×10^4–6.47×10^5copiesg^{-1} sediment) was always greater than that of AOA *amoA* gene (7.98×10^3–3.51×10^5copie sg^{-1}sediment) in all the samples analyzed in this study. The β-Proteobacterial *amoA* gene abundance was closely relatedto organic carbon, while no significant correlations were observed between archaeal *amoA* gene abundance and the environmental factors. Potential nitrification rates were significantly greater in summer than in winter and correlated strongly with the abundance of *amoA* genes. Additionally, a greater contribution of single *amoA* gene to potential nitrification occurred in summer (1.03–5.39 pmolNcopy^{-1}day^{-1}) compared with winter (0.16–0.38 pmolNcopy^{-1}day^{-1}), suggesting a higher activity of ammonia-oxidizing prokaryotes in warm seasons.

Anaerobic ammonium oxidation (anammox) bacterial diversity, abundance, and activity in marsh sediments of the Yangtze Estuary.

Hou, L.J., Zheng, Y.L., Liu, M., Gong, J., Zhang, X.L., Yin, G.Y., You, L., ***Journal of Geophysical Research – Biogeosciences,*** 2013, 118(3): 1237-1246.

Anaerobic ammonium oxidation (anammox) as an important process of nitrogen cycle has been studied in estuarine environments. However, knowledge about the dynamics ofanammox bacteria and their interactions with associated activity remains scarce in these environments. Here we report the anammox bacterial diversity, abundance, and activity inthe Yangtze Estuary, using molecular and isotope-tracing techniques. The phylogenetic analysis of 16S rRNA indicated that high anammox bacterial diversity occurred in this estuary, including *Scalindua, Brocadia, Kuenenia,* and two novel clusters. The patterns of community composition and diversity of anammox bacteria differed across the estuary. Salinity was a key environmental factor defining the geographical distribution and diversity of the anammox bacterial community at the estuarine ecosystem. Temperature and organic carbon also had significant influences on anammox bacterial biodiversity. The abundance of anammox bacteria ranged from 2.63×10^6 and 1.56×10^7 gene copies g^{-1}, and its spatiotemporal variations were related significantly to salinity, temperature, and nitrite content. The anammox activity was related to temperature, nitrite, and anammox bacterial abundance, with values of 0.94–6.61 nmolNg^{-1} h^{-1}. The tight link between the anammox and denitrification

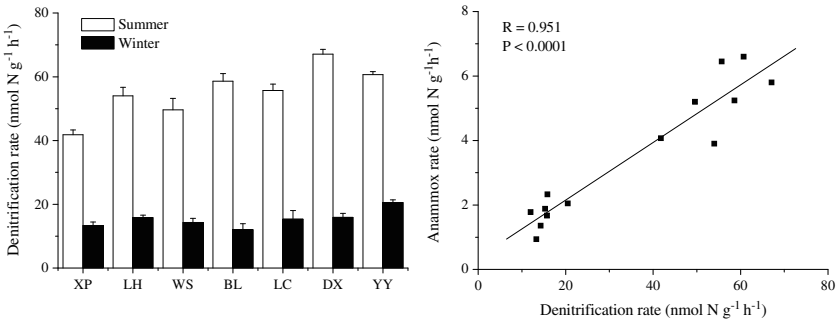


Fig. 7. The spatiotemporal variations of denitrification rates in the marsh sediments of the Yangtze Estuary and their correlation with anammox rates. Vertical bars indicate standard error (n = 3).

processes implied that denitrifying bacteria may be a primary source of nitrite for the anammox bacteria in the estuarine marshes. On the basis of the ^{15}N tracing experiments, the anammox process was estimated to contribute 6.6%–12.9% to the total nitrogen loss whereas the remainder was attributed to denitrification.

Hypoxia in the changing marine environment.

Zhang, J., Cowie, G., Naqvi, S.W.A., ***Environmental Research Letters,*** 2013, 8(1) Article Number: 015025.

The predicted future of the global marine environment, as a combined result of forcing due to climate change (e.g. warming and acidification) and other anthropogenic perturbation (e.g. eutrophication), presents a challenge to the sustainability of ecosystems from tropics tohigh latitudes. Among the various associated phenomena of ecosystem deterioration, hypoxiacan cause serious problems in coastal areas as well as oxygen minimum zones in the openocean (Diaz and Rosenberg 2008 *Science* 321 926–9, Stramma *et al* 2008 *Science* 320 655–8).The negative impacts of hypoxia include changes in populations of marine organisms, such aslarge-scale mortality and behavioral responses, as well as variations of species distributions, biodiversity, physiological stress, and other sub-lethal effects (e.g. growth and reproduction). Social and economic activities that are related to services provided by the marine ecosystems, such as tourism and fisheries, can be negatively affected by the aesthetic outcomes as well asperceived or real impacts on seafood quality (STAP 2011 (Washington, DC: GlobalEnvironment Facility) p 88). Moreover, low oxygen concentration in marine waters can have considerable feedbacks to other compartments of the Earth system, like the emission of greenhouse gases to the atmosphere, and can affect the global biogeochemical cycles ofnutrients and trace elements. It is of critical importance to prediction and adaptation strategies that the key processes of hypoxia in marine environments be precisely determined and understood (cf Zhang *et al* 2010 *Biogeosciences* 7 1–24).

Biogeochemical behavior of organic carbon in a small tropical river and estuary, Hainan, China.

Wu, Y., Bao, H. Y., Unger, D., Herbeck, L. S., Zhu, Z. Y., Zhang, J., Jennerjahn T. C., ***Continental Shelf Research,*** 2013, 57(Special Issue: SI): 32-43.

The biogeochemistry of a small tropical river and estuary (the Wanquan River (WQR)) in Hainan, China, was studied to obtain information on the sources, transformation and fate of riverine organic matter. Water and total suspended matter were sampled along a salinity gradient during four field campaigns in December 2006, August 2007, July–August 2008 and April 2009. We were able to observe the effect of heavy precipitation associated with the tropical cyclone Kammuri (2008) and a strong first-rain event (2009) on the export of organic carbon. Both dissolved organic carbon (DOC) and particulate organic carbon (POC) generally decreased with increasing salinity in the estuary, with minimal seasonal or annual variations. The POC concentrations were in the range of 18–178 μM for the WQR and were significantly correlated with chlorophyll a concentrations. The highest average values of DOC (~190 μM) were observed in 2009. These values could be the result of the flushing effect of the first rain. In the high-salinity zone, in situ productivity could be an important source for DOC. The $\delta^{13}C_{org}$ values of particles (-29.5% to -23.2%), combined with the ratio of organic carbon to total nitrogen (OC/TN), reflect a mixture of terrestrial organic matter and in situ production. The amplitudes of the POC and DOC variations on the occasion

of the first-rain event of 2009 were larger than those observed during Kammuri. It is estimated that 29.8t day^{-1} of DOC and 10.4t day^{-1} of POC, representing 6–10% of the annual loads, were delivered to the coast during the 10-day period of the first flush event in 2009. Our results demonstrate the important role of short-term aperiodic events on small rivers and estuaries along tropical coasts.

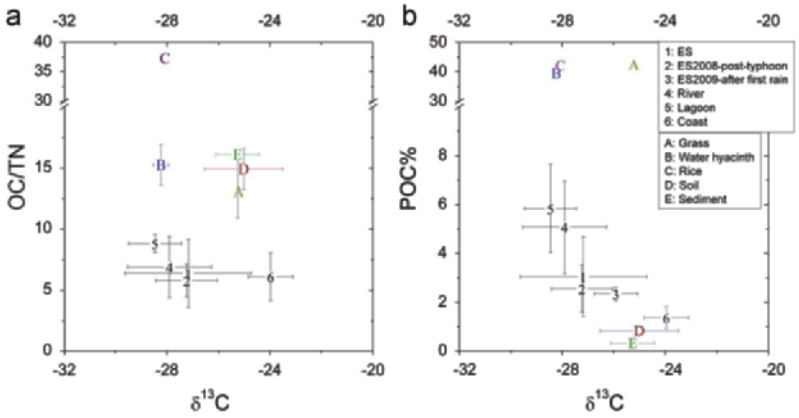


Fig. 6. Comparison of OC/TN and $d^{13}C_{org}$ values (a) and POC(%) and $d^{13}C_{org}$ values (b) among plants, soils, sediments and suspended particles in the Wanquan River.

Lagoons of the Nile delta, Egypt, heavy metal sink: With a special reference to the Yangtze estuary of China.
Gu, J.W., Salem, A., Chen, Z.Y., ***Estuarine Coastal and Shelf Science,*** 2013, 117: 282-292.

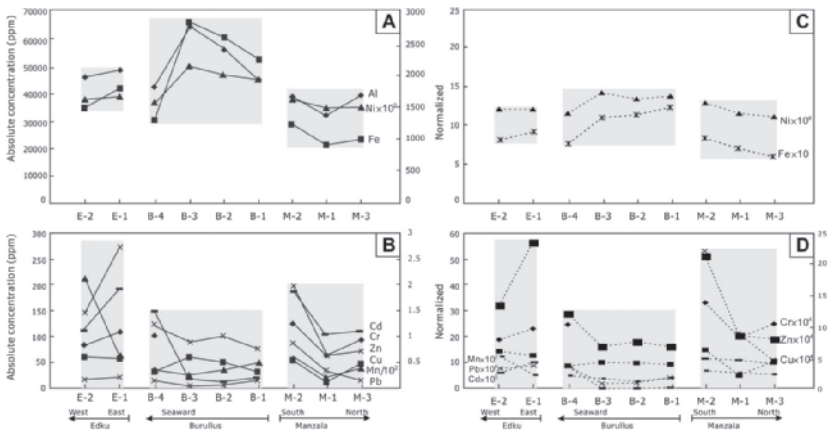


Fig. 4. Spatial distributions of heavy metals in the Nile delta lagoons (A and B e absolute content, C and D e normalized). Noted is the horse-saddle distribution of the normalized pattern, showing highs of metals in the eastern and western lagoons and low in the central lagoon.

Lagoons of the Nile delta are a vital aquacultural base for millions of people in Egypt. Since the 1960s, when the Aswan High Dam was completed, the estuary has changed from high to low turbidity and this has dramatically altered the eco-hydrological environment. In this study we attempt to explore the spatial and temporal distribution of heavy metals (Al, Cd, Cr, Cu, Fe, Mn, Ni, Pb and Zn) based on 6 short sediment cores recovered from Manzala, Burullus and Edku lagoons on the Nile delta. Radiometric dating indicates that the upper 10-15 cm of the core sediment is post-Aswan Dam. Manzala on the eastern delta coast is severely polluted by almost all metals analyzed in the present study, especially Mn, Pb, Zn and Cd, due to its connection to the city of Cairo, and the direct human input from neighboring megacities, where the petro-chemical industry is thought to be a major source. Although Burullus on the central delta coast has the lowest concentrations of Mn and Pb, there is an increasing trend, implying a linkage to local agricultural sources, and the recently expanding megacities in the central delta plain. Edku on western delta coast seems remote from any major pollution sources, but higher Mn, Pb, and Zn in the upper portion of the lake sediment suggest human influences from Alexandria to the west via the littoral current. The horse-saddle distribution pattern of polluted metals along the Nile coast, as evidenced by the Enrichment Factor (EF), is closely associated with the regulated runoff to the lower delta plain and coast, where extremely low precipitation occurs. This physical setting is certainly prone to concentrating anthropogenic heavy metals in the lagoons. The opposite example is the intensively cultivated Yangtze estuary in China, where monsoonal precipitation flushes out a huge amount of metals as manifested by the lower EF than that of the Nile.

Initiation of the Changjiang (Yangtze) delta and its response to the mid-Holocene sea level change.
Song, B., Li, Z., Saito, Y., Okuno, J., Li, Z., Lu, A.Q., Hua, D., Li, J., Li, Y.X., Nakashima, R., ***Palaeogeography, Palaeoclimatology, Palaeoecology,*** 2013. 388: 81-97.

The Changjiang (Yangtze) delta in eastern China is one of the largest tide-dominated deltas in the world. To obtain a more detailed information on its initiation, we drilled three sediment cores, PK01, HG01 and XJ03, from the uppermost region of the delta plain. On the basis of sedimentary facies and AMS ^{14}C dating, we identified three depositional systems: (1) a fluvial system, (2) an estuarine system, and (3) a deltaic system including an initial delta (estuary–delta transition) and a typical delta. The maximum flooding surface separates the estuarine and deltaic systems and occurred at ca. 8.0 cal kyr BP, when brackish water intruded landward and reached the Nanjing area. The Changjiang delta was initiated at the area between Nanjing and Yizheng when the sea-level rise decelerated after the rapid rise in sea level during 9.0–8.2 cal kyr BP.

The subsequent evolution of the Changjiang delta has been shown as a seaward development model of river mouth bars with shoreline migration. The oldest river-mouth bar called Hongqiao sand body, which is located most landward, was dated at 6.0–5.5 cal kyr BP in this study, nearly one thousand years younger than the previous estimates. A tide-dominated, funnel-shaped estuary was formed at 8.0 cal kyr BP, and lasted until the Hongqiao sand bar became exposed. This stage is regarded as an aggradation-dominated initial stage of the Changjiang delta, followed by a progradation-dominated stage that is characterized by the formation of a series of seaward migrating river-mouth bars. A relative sea level highst and in the mid-Holocene may be associated with glacio-hydro-isostatic tilting.

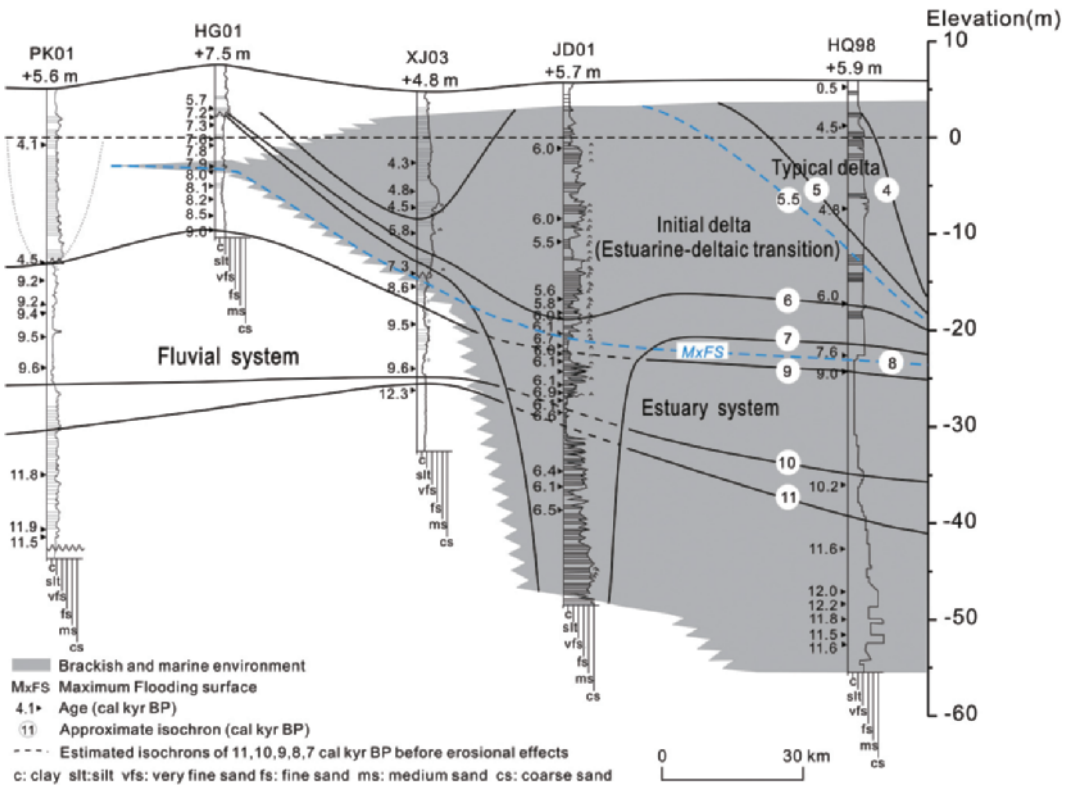


Fig. 10. Stratigraphic correlation and the initiation of Changjiang (Yangtze) delta.

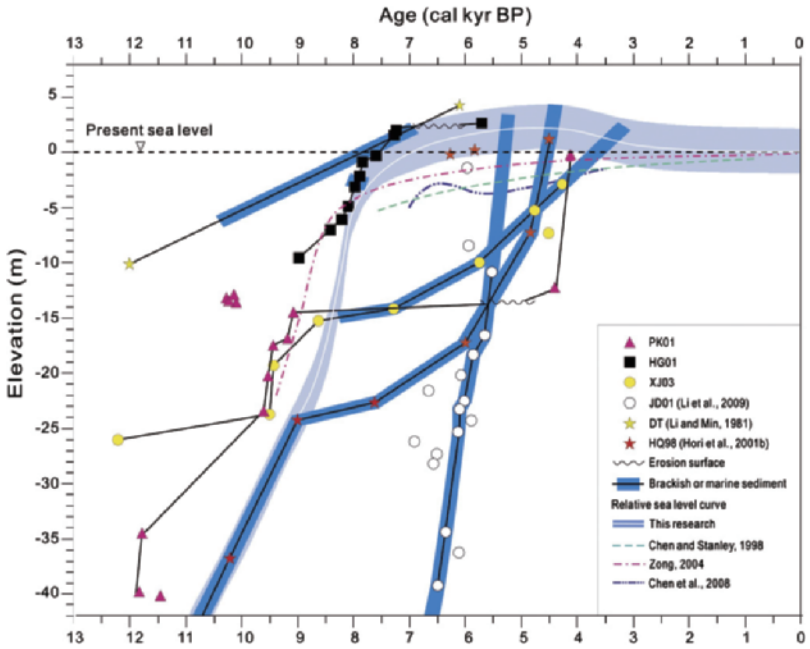


Fig. 11. Schematic diagram of accumulation curve for each core and sea-level curves. Thickness of the sea level curve in this study is vertically limited by 4 maccording to the present tidal range (Li and Min, 1981; Chen and Stanley, 1998; Hori et al., 2001b; Zong, 2004; Chen et al., 2008; Li et al., 2009).

A raised OIS 3 sea level recorded in coastal sediments, southern Changjiang delta plain, China.
Wang, Z.H., Jones, B.G, Chen, T., Zhao, B.C., Zhan, Q., ***Quaternary Research,*** 2013, 79(3): 424-438.

The distribution of marine-influenced oxygen isotope stage (OIS) 5 to OIS sediments was examined in several late Quaternary boreholes from the southern Changjiang (Yangtze) delta plain, China, using different dating methods including OSL, U-series, AMS ^{14}C and paleomagnetism. Results demonstrate that coastal and estuarine deposition during OIS 5 and OIS 3 occurred throughout the study area. However, Holocene transgressive sediments were absent on the Taihu block. The burial depth of intertidal to subtidal sediment deposited during OIS 5e records 30–80 m subsidence caused by sediment compaction and tectonic movement since that time. However, coastal sediments formed during the late phase of OIS 3 were buried to a depth of ca. 6–15 m in the Taihu Lake area, while the burial depth increased eastward to ca. 45–60 m on the coastal plain. This phenomenon, combined with the distribution of Holocene marine strata, indicates at least 25–30 m uplift of the Taihu block since the end of OIS 3. We suggest that this uplift was mainly caused by the differential subsidence due to substantial amount of post-glacial deposition by the Changjiang and Huanghe Rivers on the continental shelf of east China marginal sea.

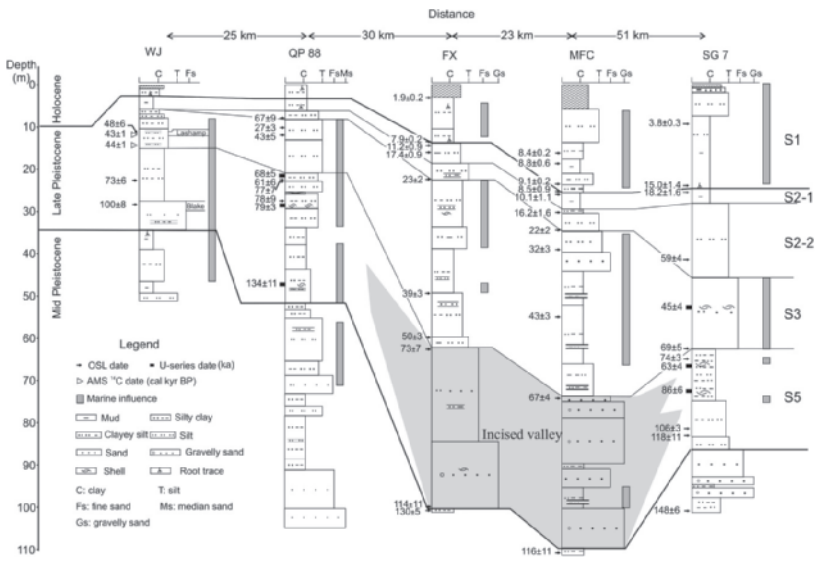


Fig. 9. Stratigraphic correlation between the OSL, U-series, AMS ^{14}C and paleomagnetically dated boreholes from the southern Changjiang delta plain. Boreholes FX and MFC are from Zhao et al. (2008). The codes from S1 to S5 represent the time of deposition from OIS 1 to OIS 5 for the strata. A significant incised valley at FX and MFC during the lowstands of OIS 5d, 5b and 4 was responsible for the thicker sedimentary succession deposited during S3.

Impact of the conversion of mangroves into aquaculture ponds on the sedimentary organic matter composition in a tidal flat estuary (Hainan Island, China).

Bao, H.Y., Wu, Y., Unger, D., Du, J.Z., Herbeck, L.S. Zhang, J., ***Continental Shelf Research,*** 2013, 57 (Special Issue: SI): 82-91.

A sediment core was collected from an estuarine tidal mudflat off a mangrove area to study the impact of land-use change on sedimentary organic matter (OM) in Hainan Island, South China. Bulk properties (organic carbon (OC%), total nitrogen (TN%), stable organic carbon isotopes ($\delta^{13}C_{org}$) and stable nitrogen isotopes ($\delta^{15}N$)) as well as biomarkers (amino acids (AA) and lignin phenols) were used to trace the sources of OM. The average value of OC% was 0.63±0.07% and TN% was 0.054±0.006%. The molar ratio of organic carbon and total nitrogen (C/N ratio) was 11–17 and the $\delta^{13}C_{org}$ values ranged from -23‰ to -25‰, which suggested a mixture of aquatic OM and terrigenous OM. The ratio of AA to lignin phenols (AA/lignin) also confirmed that aquatic OM must be considered as an important source of OM. Lower C/N and elevated $\delta^{15}N$ in the upper core was caused by the increased OM input from aquaculture ponds and/or sewage during recent decades. The higher degree of lignin phenol degradation and its relatively lower concentrations in the upper sediment core suggests reduced input of OM from fresh mangrove plant tissue. A three end-member model based on $\delta^{13}C_{org}$ and $\delta^{15}N$ quantified the contribution of OM from each source (i.e., mangrove plants, marine phytoplankton and aquaculture ponds). The results showed that the input from aquaculture increased from <5% in pre- 1970 period to around 30% during the past 40 years, and the contribution from mangrove forest decreased from >30% to around 5%, accordingly. This finding is consistent with the land use change in the study area over the past decades. Our results suggested that because of the degradation of mangrove forests and increase of aquaculture, more anthropogenic OM would be transported to the coastal sea.

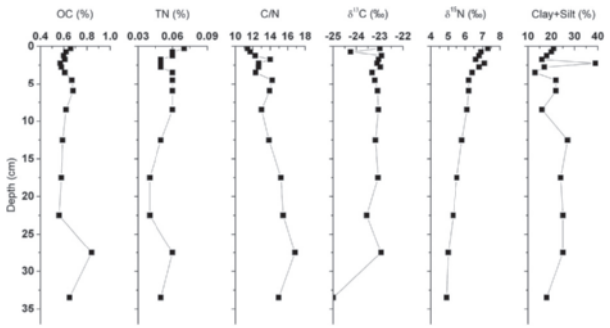


Fig. 3. Bulk properties of M3 sediment core.

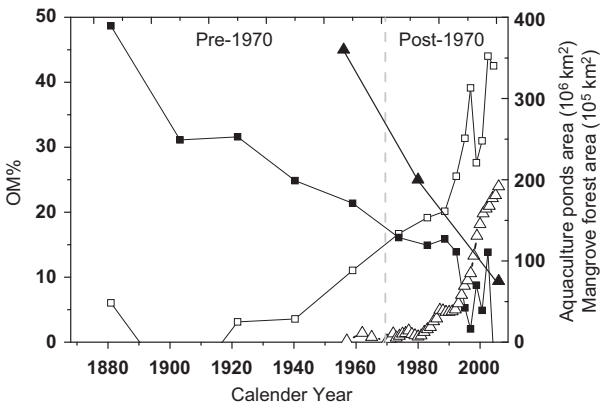


Fig. 7. Results of three end-member value and local statistical results. Solid square (■) represents OM contribution from mangrove forest, open square (□) represents OM contribution from aquaculture ponds. Solid triangles (▲) show the change of mangrove area, data were derived from literatures (Herbeck, 2012; Zheng et al., 1995); open triangles (△) reflects the change of aquaculture area of Wenchang city since 1950s, data were from Hainan Statistical Yearbook (2007). The vertical gray line represents the year of 1970.

Impacts of large dams on downstream fluvial sedimentation: An example of the Three Gorges Dam (TGD) on the Changjiang (Yangtze River).

Dai, Z.J., Liu, J.T., ***Journal of Hydrology,*** 2013, 480: 10-18.

Under the influence of climate and human activities, fluvial systems have natural ability to make adjustments so that the river hydrology, sediment movement, and channel morphology are in dynamic equilibrium. Taking the Changjiang (Yangtze River) for example. In the early stages after the Three Gorges Dam (TGD) began operational ten years ago, the suspended sediment content (SSC) and fluxes in the middle and lower reaches of the river decreased noticeably. At present, they appear to be in a stable state on the decadal scale. Although the river runoff has not shown any trends, the water level in the river decreased appreciably in time. In the meantime, channel

down cutting along the thalweg almost existed throughout the river course. The riverbed has turned from depositional before the dam construction to erosional afterwards. In other words, the riverbed had turned from being sediment sinks to sediment sources. In the main channel of the Changjiang between Yichang and Nanjing, a distance of 1300 km, the riverbed sedimentation mode displays strong, intermediate, and weak erosion depending on the closeness to the TGD.

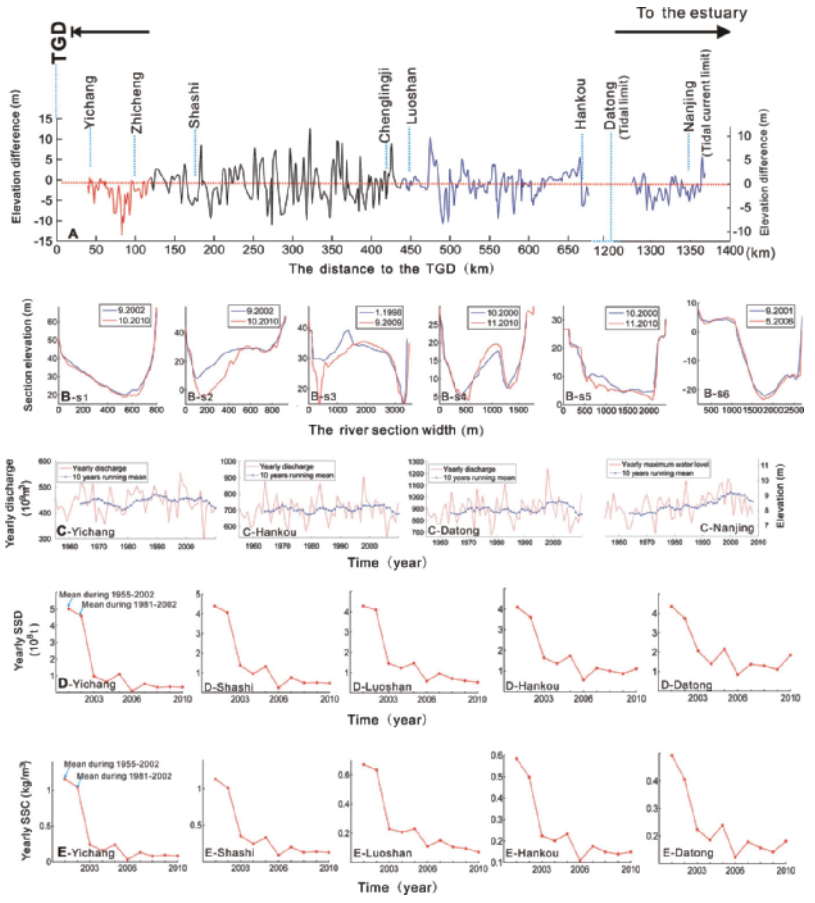


Fig. 3. Spatial and temporal variability along the river course of the Changjiang including: (A) changes in the thalweg depth along the river course (based on Fig. 1C), (B) changes on the cross-section at 6 locations; (C) The yearly river runoff at Yichang, Hankou, and Datong and the max. high water level at Nanjing; Composites of SSC (D) and SSD (E) at five reference stations, in which the first data point is the mean value between 1955 and 2002, the second point is the mean value between 1981 and 2002, and the rest points are mean yearly values.

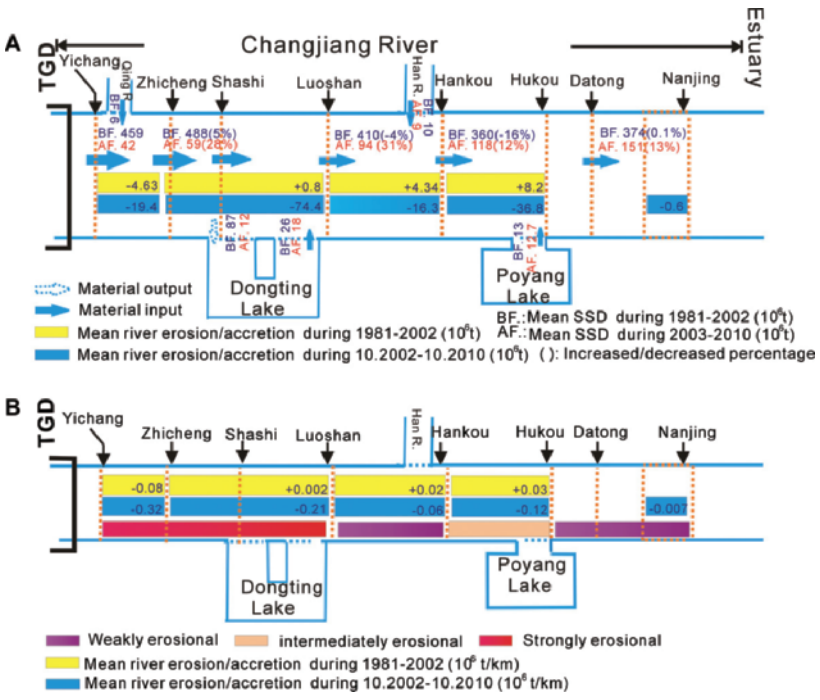


Fig. 4. The box model for the sediment budget of the middle and lower reaches of the Changjiang. (A) Comparison between the pre-TGD (BF, 1982–2002) and post-TGD (AF, 2003–2010) suspended sediment budget and the amount of riverbed erosion/accretion. Values for the Nanjing segment are the mean between September 2001–May 2006. Numbers in the parentheses are the percentage of change within the segment as compared to the adjacent segments and (B) riverbed erosion/accretion per unit length of the river.

A thirteen-year record of bathymetric changes in the North Passage, Changjiang (Yangtze) estuary.

Dai, Z.J., Liu, J.T., Fu, G., Xie, H.L., ***Geomorphology,*** 2013, 187: 101-107.

The mouths of major rivers in the world have always been important waterways and as a result, subject to significant human intervention. Therefore, it is necessary to understand the coupling of natural processes and human intervention in the sediment movement and deposition to determine long-term morphodynamic evolution in the mouth regions of major rivers. A multivariate technique was used to analyze high-resolution bathymetric data from the North Passage of Changjiang (Yangtze River), which is the vital shipping channel in the mouth region and for the entire Changjiang waterway. Our findings show that there are two modes of bathymetric changes. The first mode represents 85% of the variability, which includes the deposition in the peripheral groin fields along the shipping channel and deepening of the shipping channel, which is primarily due to the channel maintenance. The second mode represents 6% of the variability of the river-mouth shoal (seaward migration and size reduction), attributable to the declining sediment discharge of the Changjiang due to the Three Gorges Dam, and the enhancement of the ebb flow as the result of dredging.

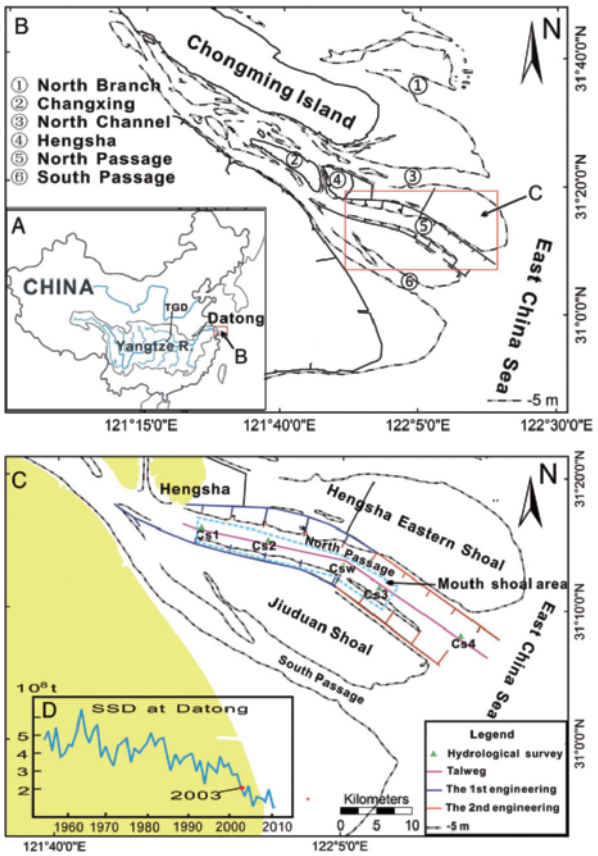


Fig. 1. Geographic information of the study area including (A) the map of China, which shows the Changjiang river basin, the locations of the Three Gorges Dam (TGD) and the Datong gauging station; (B) three-tiered branching Changjiang Estuary and the four bifurcated channels; (C) enlarged map of the North Passage showing the locations of the T-shaped groins and the 5 hydrographic stations where river flow was measured; and (D) the suspended sediment discharge (SSD) recorded at Datong over the past 50 years.

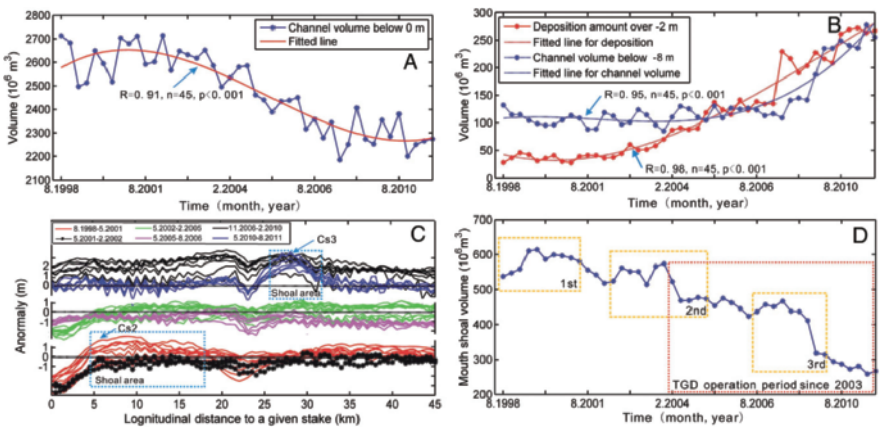


Fig. 3. Secular changes showing (A) the channel capacity (volume below0 m) of the N. Passage, (B) volume changes of the N. Passage above −2 m depth (asterisk line) and below −8 m depth (asterisk dashed curve), (C) depth anomaly from the thalweg in each of 6 time periods, and (D) the volume of the mouth shoal.

Remotely sensed variability of the suspended sediment concentration and its response to decreased river discharge in the Yangtze estuary and adjacent coast.

Shen, F., Zhou, Y.X., Li, J.F., He, Q., Verhoef, W., ***Continental Shelf Research,*** 2013, 69, 52-61.

Satellite observation is an excellent tool for exploring the variability of the suspended sediment concentration (SSC) of turbid estuarine and coastal waters. We used a recently developed semi-empirical radiative transfer model combined with a multi-wavelength switching algorithm for the SSC retrieval from MEdium Resolution Imaging Spectrometer (MERIS) satellite data. This method can successfully retrieve SSC from satellite data in turbid estuarine and coastal waters with a wide range of sediment concentrations (20–2500 mgl^{-1}) and is robust for quantifying realistic patterns of the surface sediment dynamics. The seasonal and annual variability of the MERIS-derived SSC from 2003 to 2010 were analysed in this work. Five regions-of-interest (ROIs) in the Yangtze estuary and coast are included in the analysis: the upper estuary, the lower estuary, the outer estuary, the Hangzhou Bay and the Qidong shore. The results reveal that the SSC of the upper estuary has significant seasonal and annual variations in response to seasonal cycling and annual fluctuation of the river discharge. Along-term continuing decrease of river discharge may cause an overall decline of the SSC in the entire estuary and adjacent areas. The existence of horizontal exchanges of the sediments between the Yangtze estuary and the Jiangsu coast implies that the decreased fluvial sediment loads of the estuary may partially be compensated by supplementing contributions from other origins.

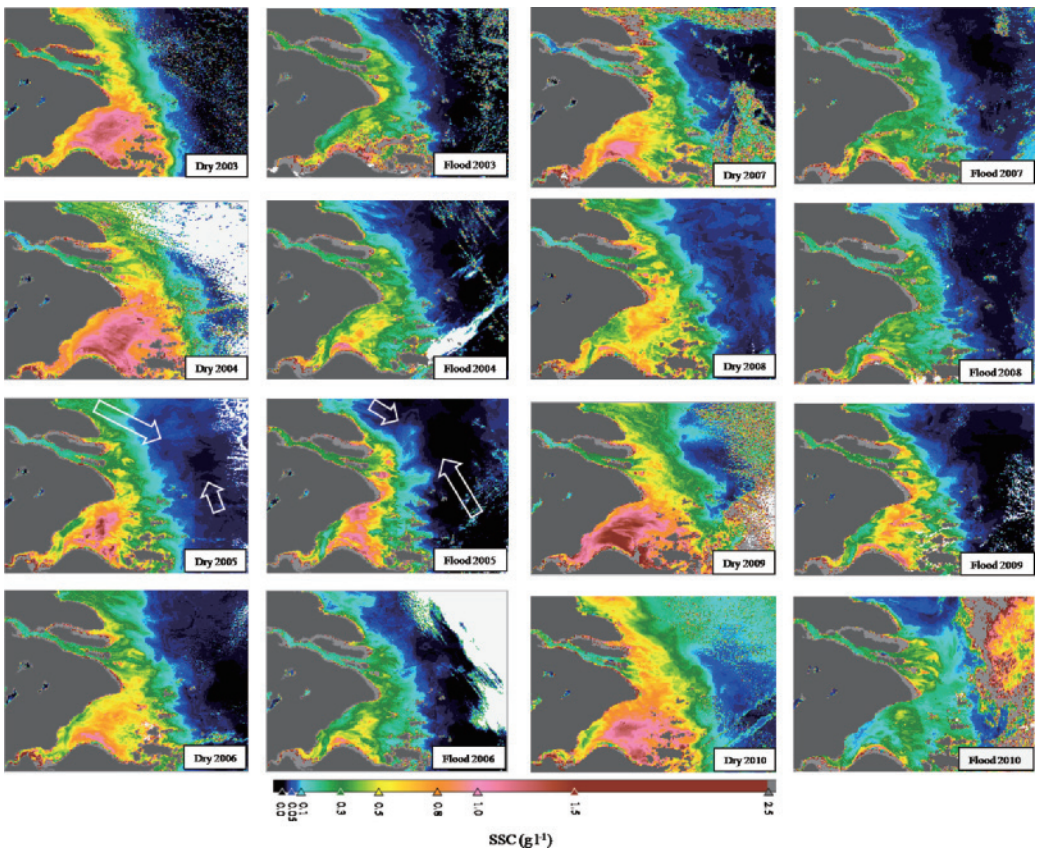


Fig. 3. Seasonal composite images of the MERIS-derived suspended sediment concentration (SSC), with the two situations for January–March (dry season peak) and for July–September (flood season peak), between 2003 and 2010. The dark grey area denotes land, and the coloured areas are the results of the SSC retrieval marked by the scalebar. White flecks on the maps are clouds. The arrows on the map denote the Jiangsu alongshore current and the Taiwan warm current. The arrow lengths depict the strength of the flows. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.).

Mechanisms of along-channel sediment transport in the North Passage of the Yangtze Estuary and their response to large-scale interventions.

Jiang, C.J., Swart, H.E., Li, J.F., Liu, G.F., ***Ocean Dynamics,*** 2013, 63(2-3): 283-305.

The effects of large-scale interventions in the North Passage of the Yangtze Estuary (the Deep Waterway Project, DWP) on the along-channel flow structure, suspended sediment distribution and its transport along the main channel of this passage are investigated. The focus is explaining the changes in net sediment transport in terms of physical mechanisms. For this, data of flow and suspended sediment concentration (SSC), which were collected simultaneously at several locations and at different depths along the main channel of the North Passage prior to and after the engineering works, were harmonically analyzed to assess the relative importance of the transport components related to residual (time-mean) flow and various tidal pumping mechanisms. Expressions for main residual flow components were derived using theoretical principles. The SSC revealed that the estuarine turbidity maximum (ETM) was intensified due to the interventions, especially in wet seasons, and an upstream shift and extension of the ETM zone occurred. The amplitude of the M_2 tidal current considerably increased, and the residual flow structure was significantly altered by engineering works. Prior to the DWP, the residual flow structure was that of a gravitational circulation in both seasons, while after the DWP, there was seaward flow throughout the channel during the wet season. The analysis of net sediment transport reveals that during wet seasons and prior to the DWP, the sediment trapping was due to asymmetric tidal mixing, gravitational circulation, tidal rectification, and M_2 tidal pumping, while after the DWP, the trapping was primarily due to seaward transport caused by Stokes return flow and fresh water discharge and landward transport due to M_2 tidal pumping and asymmetric tidal mixing. During dry seasons, prior to the DWP, trapping of sediment at the bottom relied on landward transports due to Stokes transport, M_4 tidal pumping, asymmetric tidal mixing, and gravitational circulation, while after the DWP the sediment trapping was caused by M_2 tidal pumping, Stokes transport, asymmetric tidal mixing, tidal rectification, and gravitational circulation.

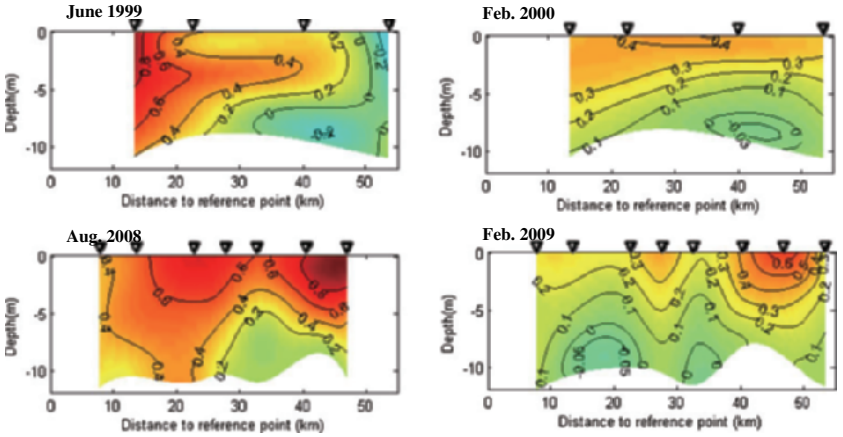


Fig. 6. Residual flow (in meters per second) structures in the North Passage. Plus sign means seaward flow and minus sign means landward flow. Left panels display the structures in wet seasons, while right panels display the structures in dry seasons. Top row displays the structures prior to the DWP, while bottom row displays the structures after the DWP

Has Suspended Sediment Concentration Near the Mouth Bar of the Yangtze (Changjiang) Estuary Been Declining in Recent Years?

Dai, Z.J., Chu, A., Li, W.H., Li, J.F., Wu, H.L., ***Journal of Coastal Research,*** 2013, 29(4): 809-818.

There are considerable concerns about the decrease in suspended sediment discharge (SSD) into the large estuaries of the world as a result of extensive anthropogenic activities in their catchment areas. With the operation of Three Gorges Dam (TGD) in 2003, the riverine loads into the Yangtze (Changjiang) Estuary have been greatly changed with the sharp decrease of SSD and suspended sediment concentration (SSC). However, according to our analysis on the SSC in the surfacial water measured at different stations in the Yangtze Estuary, we conclude that the spatial characteristics of the annual mean SSC around the mouth bar area show no apparent change yet, even though the TGD was constructed with an ascending trend at the upper part of the estuary. The spring–neap periodicity of the daily mean SSC after the TGD was constructed remained the same as before. Moreover, the seasonal and annual mean SSC at the inner side of the mouth bar was relatively low due to the large reduction

of upstream sediment supply after the operation of TGD began in 2003. But the seasonal and yearly mean SSC at the outer side of the mouth bar during 2007–2009 is comparable with those before the TGD operated, even though there is a decreasing trend of SSC into the Yangtze Estuary in corresponding years.

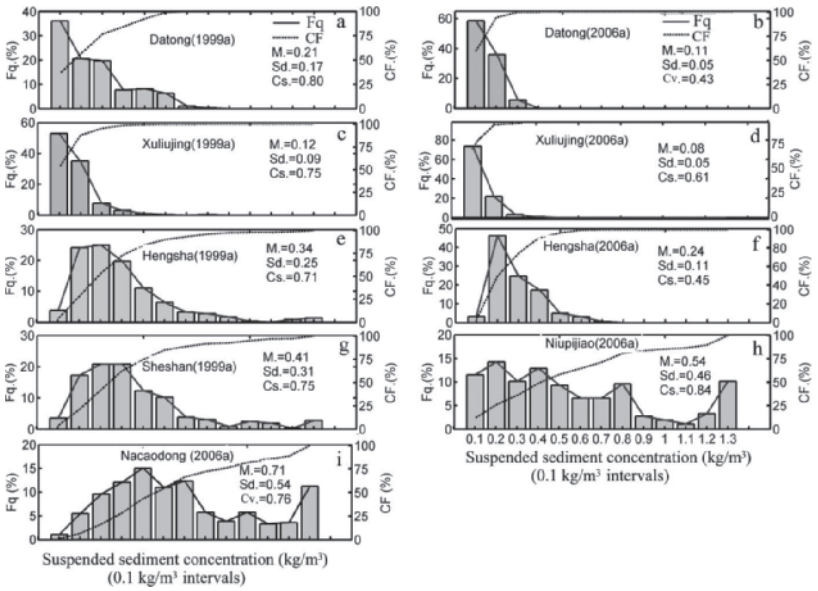


Fig. 4. SSC occurrence at stations in 1999 and 2006 (Fq: frequency curve; CF: cumulative frequency curve; M: monthly mean; Sd: standard deviation; Cv: variation coefficient, Cv=Sd/M, representing the deviation of the SSC from the monthly mean).

Influence of seasonal runoff regulation by the Three Gorges Reservoir on saltwater intrusion in the Changjiang River Estuary.

Qiu, C., Zhu, J.R., ***Continental Shelf Research,*** 2013, 71: 16-28.

The Three Gorges Reservoir (TGR) is the largest water conservancy project in the world. It significantly regulates discharge of the Changjiang River on a seasonal scale. It stores water in autumn and drains it during the following dry season. Although the effects of the TGR on various processes in the river, estuary, and adjacent seas have been studied extensively, the TGR's influence on saltwater intrusion around the estuary and its impacts on vital fresh water reservoirs have not been quantitatively evaluated. In this study, we used a well-validated numerical model to simulate the seasonal-scale saltwater intrusion around the Changjiang Estuary under scenarios with and without the TGR regulation. Results showed that during the autumn season, the TGR advanced the timing of saltwater intrusion and slightly increased its intensity. In contrast, as the TGR supplemented river discharge during the dry season, saltwater intrusion around the fresh water reservoirs was significantly suppressed. Moreover, duration of saline water (salinity>0.45, the standard for drinking water) at the Dongfengxisha, Chenhang,and Qingcaosha Reservoirs was shortened by about 16%, 73.1%, and 48%, respectively. The model results showed that overall, operation of the TGR is basically favorable for reducing the burden off reshwater supplement in the high-populated estuarine region.

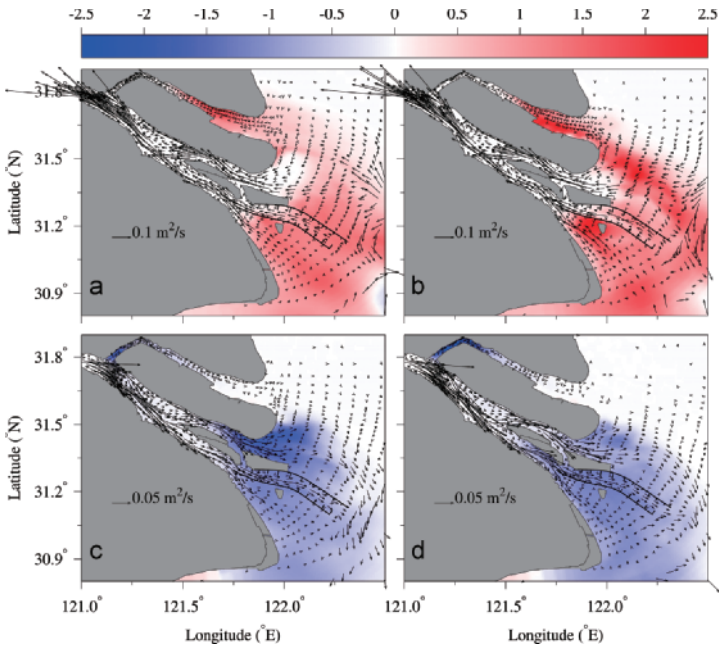


Fig. 7. Differences between vertically averaged residual water transport and salinity before and after the TGR began operating. Comparisons are for spring tide (a) and neap tide (b) during the wet season and spring tide (c) and neap tide (d) during the dry season. The positive various means salinity increase after the TGR, and the negative various indicates salinity decrease after the TGR.

Evaluation of surface water mixing and associated nutrient fluxes in the East China Sea using ^{226}Ra and ^{228}Ra.
Su, N., Du, J.Z., Li, Y., Zhang, J., ***Marine Chemistry,*** 2013, 156 (SI): 108-119.

Advection and diffusion are recognized as two important processes in the mixing and exchange of coastal waters and associated nutrients. In this study, Ra isotopes (^{226}Ra and ^{228}Ra) are surveyed in the East China Sea (ECS) to investigate the advection and diffusion processes. Both one-dimensional (1D) and two-dimensional (2D) advection–diffusion models are applied to estimate the cross-shore and along-shore eddy diffusivities and advection velocities. The advection velocity is basically small in magnitude, suggesting its secondary role in transport. The cross-shore 1D model gives promising results on the diffusivity by 4.93×10^5 cm^2 s^{-1}. Sensitivity analysis shows that the cross-shore diffusivity is less sensitive whereas the along-shore diffusivity is quite sensitive to advection velocity. Introducing benthic Ra flux in the model decreases the eddy diffusivity. A quisi-2D method generates an along-shore diffusivity by 2.50×10^7 cm^2 s^{-1}, which is within the sensitivity range thus reliable. Based on the estimated diffusivity and advection velocities, we calculate the offshore nutrient fluxes (mol m^{-2} d^{-1}) by 0.44 for dissolved inorganic nitrogen (DIN), 0.012 for dissolved inorganic phosphorous (DIP) and 0.26 for dissolved inorganic silicates (DSi). The along-shore fluxes (mol m^{-2} d^{-1}) are 6.44 for DIN, 0.10 for DIP and 2.92 for DSi. Compared with nutrient inputs from other sources, e.g. river, sediments, and ocean, the horizontal mixing derived nutrient fluxes contribute only b4% N, b1% P and b2% Si to the nutrient requirements for primary productivity in the study area. This study stresses the role of advection and diffusion in the material transport, i.e. nutrients and stoichiometry in the ECS.

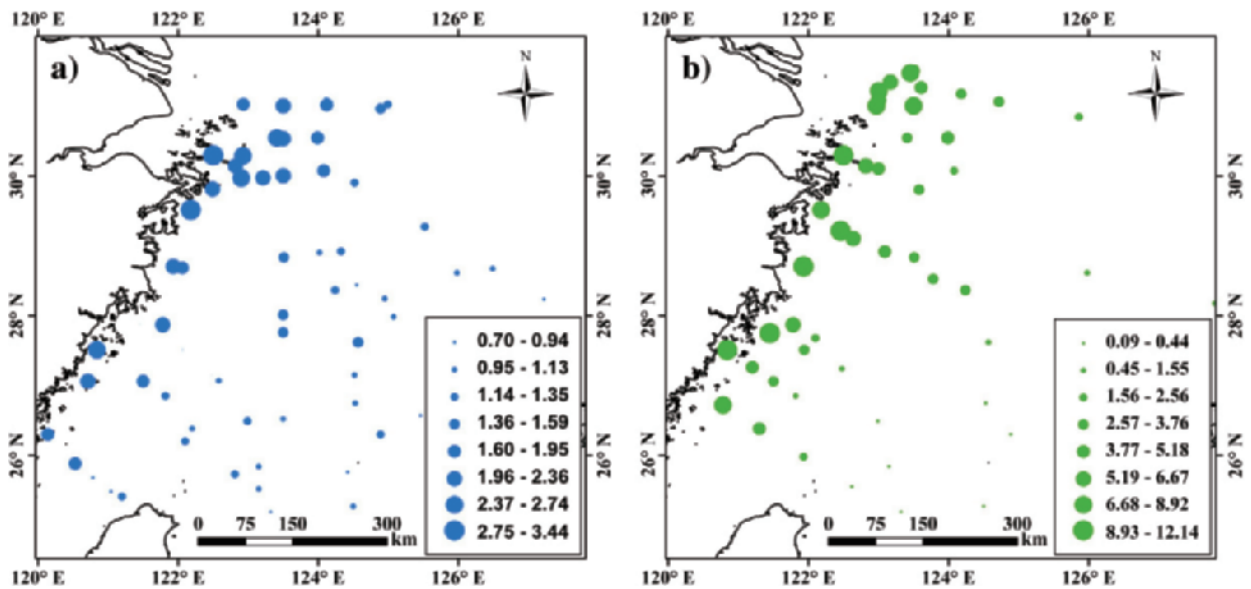


Fig. 7. Distribution of (a) ^{226}Ra and (b) ^{228}Ra activities (Bq m^{-3}) in the East China Sea.
Data source includes Nozaki et al. (1991), Zhang (2007), Liu et al. (2010a), Men et al. (2010), Chen et al. (2011), Xu (2011) and this work.

Inter-comparison of radium analysis in coastal sea water of the Asian region

Du, J.Z., Moore, W.S., Hsh, H.F., Wang, G.Z., Scholten, J., Henderson, P., Men, W., Rengarajan, R., Sha, Z.J, Jiao, J.J., ***Marine Chemistry,*** 2013, 156 (SI): 138-145.

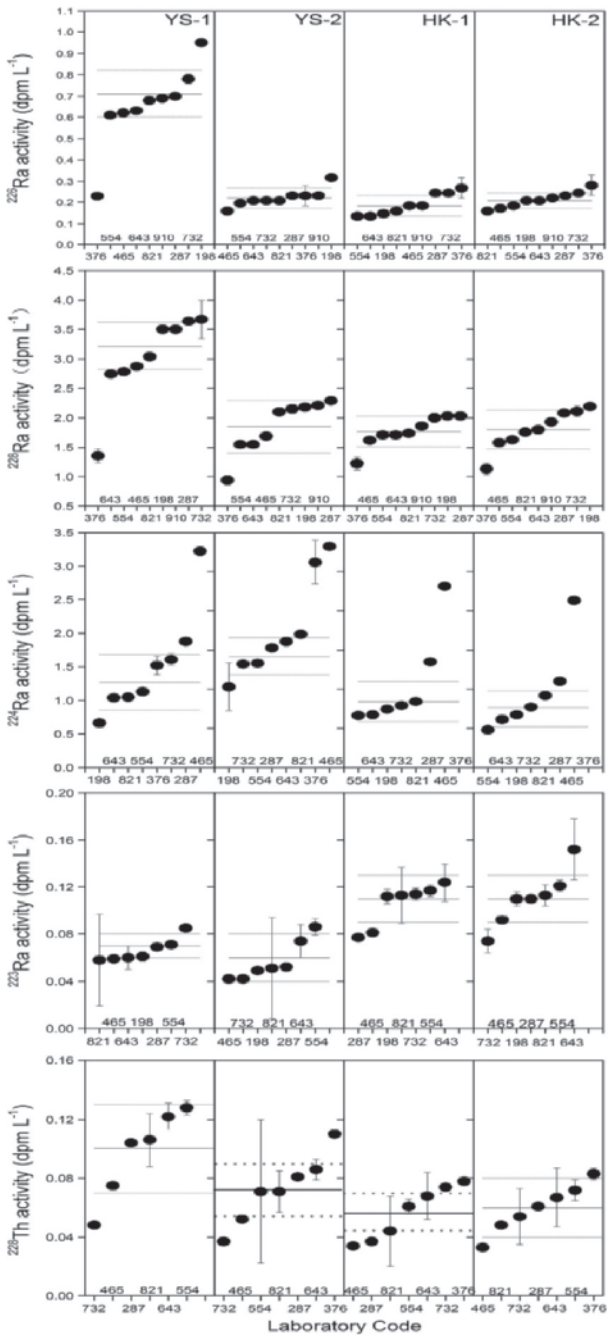


Fig. 5. The reported activities of ^{226}Ra, ^{228}Ra, ^{224}Ra, ^{223}Ra and ^{228}Th, the concerned average values and their errors.

Laboratory inter-comparison is one of the methods used for regularly assessing the accuracy of the analytical data produced by laboratories for particular measurements. A working group at the 2010 GEOTRACES Asia Planning Workshop in Taipei recommended that a Ra inter-comparison experiment be conducted in the surface sea water of the Asian coastal region. In May 2011, we organized the Asian Ra Inter-comparison experiment. Analytes included ^{223}Ra, ^{224}Ra, ^{226}Ra, ^{228}Ra, and ^{228}Th. Nine laboratories joined this activity. One sample set was collected in the coastal region of the Yellow Sea, near Qingdao, China (YS1, YS2) and another in Tolo Harbor of Hong Kong (HK1, HK2). These waters are relatively high in Ra and low in suspended matter and can be considered representative of coastal waters in the region. The results show that most of the data reported by different labs is within two standard deviations of the mean. Radium extraction efficiencies based on two Mn-fiber columns attached in series averaged 95–99%. Results for ^{226}Ra, ^{223}Ra, and ^{228}Th in the Asia Inter-comparison are considerably less scattered than in the GEOTRACES Atlantic Inter-comparison. For ^{228}Ra the Asia and GEOTRACES results are similar; but for ^{224}Ra, the Asia results are considerably more scattered than the GEOTRACES results.

海岸动力地貌与动力沉积过程
Coastal Dynamical Geomorphology and Sediment Process

Detiding Measurement on Transport of the Changjiang-Derived Buoyant Coastal Current.

Wu H., Deng, B., Yuan, R., Hu, J., Gu, J.H., Shen, F., Zhu, J.R., Zhang, J., ***Journal of Physical Oceanography,*** 2013, 43: 2388-2399.

Measuring the transport of the Changjiang (also known as the Yangtze) River–derived buoyant coastal current, that is, the Min–Zhe Coastal Current, is of great importance for understanding the fate of terrestrial materials from this large river into the open ocean, but it is usually difficult to achieve because of the energetic tidal currents along the Chinese coast. In February 2012, a detiding cruise survey was carried out using the phase-averaging method. For the first time, this coastal current has been quantified with in situ data and has been shown to have a volume transport of 0.215 Sv (1 Sv≡10^6m^3 s^{-1}) and a maximum surface velocity of ~50cm s^{-1}. The ratio between the volume transport of the buoyant coastal current and that of the Changjiang is *O* (10). Freshwater transport by the buoyant coastal current accounts for over 90% of the Changjiang River's discharge. Buoyancy and winds are both important in driving this current.

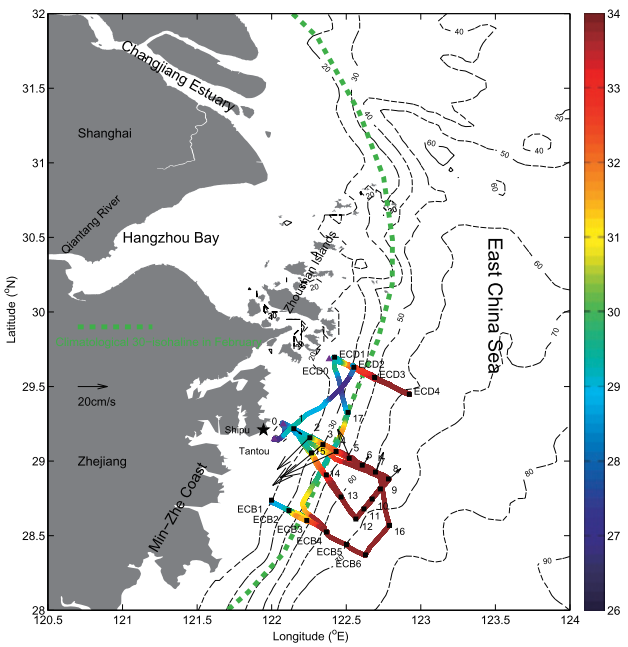


Fig. 1. Survey location and bathymetry around the Min–Zhe Coast area. Rectangular dots signify the sampling sites, and triangular dots represent the anchored sites.The PAM survey was conducted at sites 1–15. The colored line shows the observed surface salinity. Arrows show the observed residual current at 4.25m below the sea surface. The dashed green line signifies the climatological 30 isohaline in February that is digitized from Editorial Board for Marine Atlas (1992).

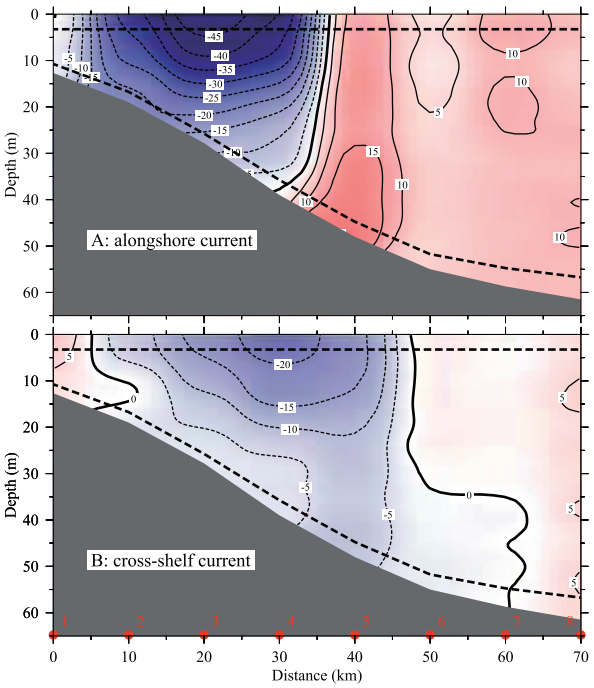


Fig. 4. Sectional profiles of the residual currents (cm s21) measured along sites 1–8. (a) Alongshore current (northward positive) and (b) cross-shelf current (eastward positive). Red dots and numbers signify the sites. Thick dashed lines indicate the upper and lower blank layers.

An integrated East China Sea-Changjiang Estuary model system with aim at resolving multi-scale regional-shelf-estuarine dynamics.

Ge, J.Z., Ding, P.X., Chen, C.S.,Hu S., Fu, G., Wu, L.Y., ***Ocean Dynamics,*** 2013, 63(8): 881-900.

A high-resolution numerical model system is essential to resolve multi-scale coastal ocean dynamics. So a multiscale unstructured grid-based finite-volume coastal ocean model (FVCOM) system has been established for the East China Sea and Changjiang Estuary (ECS–CE) with the aim at resolving coastal ocean dynamics and understanding different physical processes. The modeling system consists of a threedomain-nested weather research and forecasting model, FVCOM model with the inclusion of FVCOM surface wave model in order to understand the wave–current interactions. The ECS–CE system contains three different scale models: a shelf-scale model for the East China Sea, an estuarine-scale model for the Changjiang Estuary and adjacent region, and a fine-scale model for the deep waterway regions. These three FVCOM-based models guarantee the conservation of mass and momentum transferring from outer domain to inner domain using the one-way common-grid nesting procedure. The model system has been validated using data from various observation data, including surface wind, tides, currents, salinity, and wave to accurately reveal the multi-scale dynamics of the East China Sea and Changjiang Estuary. This modeling system has been demonstrated via application to the seasonal variations of Changjiang diluted water and the bottom saltwater intrusion in the North Passage, and it shows strong potential for estuarine and coastal ocean dynamics and operational forecasting.

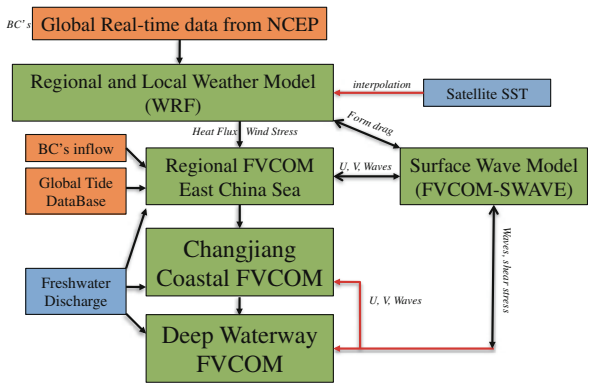


Fig. 2. Framework of the multi-scale FVCOM-based model system, including the regional East China Sea FVCOM, coastal Changjiang Estuary FVCOM, and local deep waterway FVCOM and their related internal and external models and modules

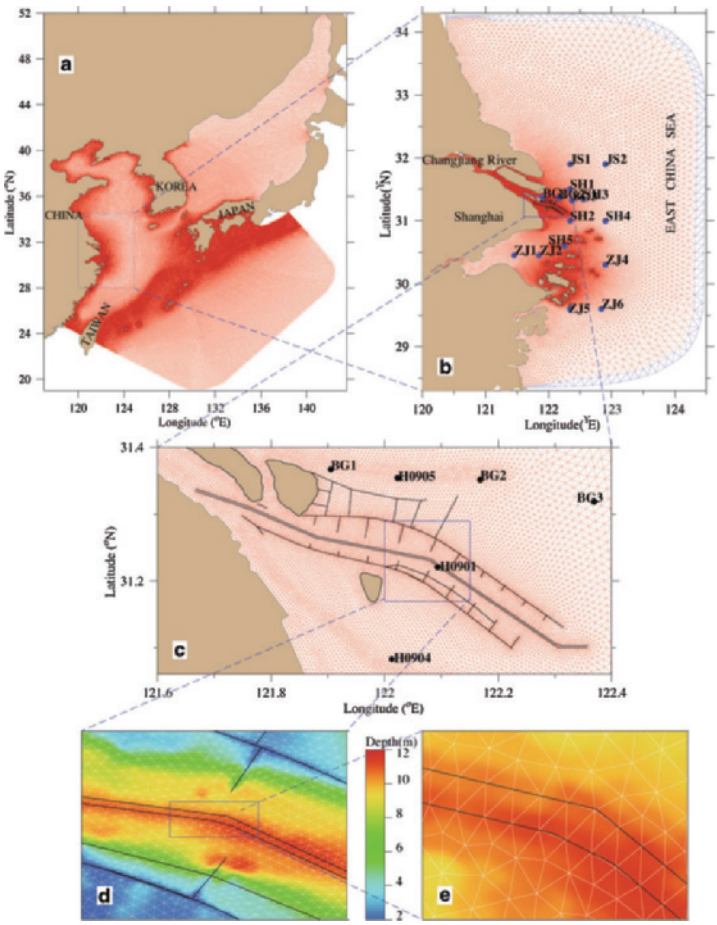


Fig. 5. High-resolution triangle grids for the East China Sea shelf (a), Changjiang Estuary and its adjacent regions (b), and the Deep Waterway Project region (c). Enlarged views include the middle part of the North Passage, where there are dikes and groynes (d) and the shipping channel region (e). The blue grid in b shows the common grid boundary for nesting between ECS-FVCOM and CE-FVCOM. The blue dots in b and black dots in c indicate the observation stations for validations

Early to mid-Holocene rapid sea-level rise and coastal response on the southern Yangtze delta plain, China.
Wang, Z.H., Zhan, Q., Long, H.Y., Saito, Y., Gao, X.Q., Wu, X.X., Li, L., Zhao, Y.N., ***Journal of Quaternary Science,*** 2013, 28(7): 659-672.

We used accelerator mass spectrometry (AMS) ^{14}C-dated sediments of the Holocene basal supratidal flat to upper tidal flat facies in 11 cores on the southern Yangtze delta plain to reconstruct relative sea levels of 8.5–8.0 cal ka BP. Three cores were further AMS ^{14}C dated and used to examine the evolution of sedimentary geomorphological environments in response to the rapid sea-level rise during the early to mid-Holocene. Results demonstrate relative sea-level rise of around 30mm a^{-1} from 8.5 to 8.3 cal ka BP and around 10mm a^{-1} from 8.3 to 8.0 cal ka BP. Retrogradation from supratidal to lower tidal flat environments occurred in response to the rapid sea-level rise at 8.5–8.3 cal ka BP, and aggradation from middle to upper tidal flat occurred at 8.3–7.9 cal ka BP. Further retreat of the tidal flat at 7.9–7.2 cal ka BP implies a mean sea-level rise rate exceeding 5mm a^{-1} at this time. We suggest that the rapid relative sea-level rise during 8.3–8.5 cal ka BP and subsequent slower rise caused drastic changes in the coastal zone and that these changes are key phenomena for understanding the coastal response to future sea-level rise.

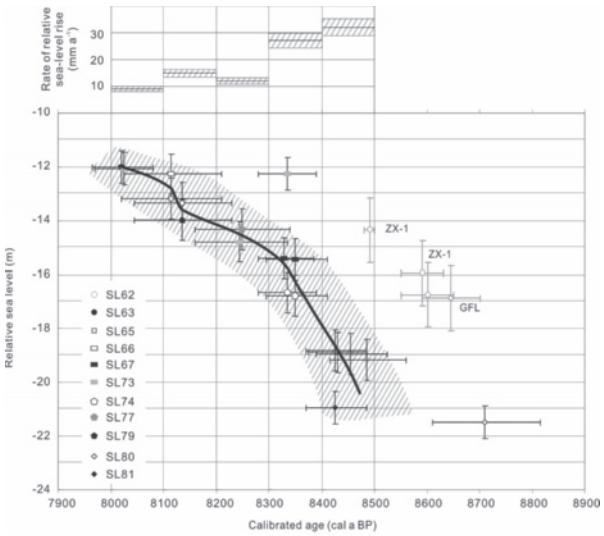


Fig. 8. Reconstructed relative sea-level curve and rate of relative sea-level rise for the southern Yangtze delta plain during 8.0–8.5 cal ka BP (detailed data in Table 4) along with the data from cores GFL and ZX-1 from Wang et al. (2012). The hatched area represents the range of relative sea level from most of the data, and the thick line represents our preferred sea-level curve.

Response of the turbidity maximum zone to fluctuations in sediment discharge from river to estuary in the Changjiang Estuary (China).
Jiang, X.Z., Lu, B. , He, Y.H., ***Estuarine Coastal and Shelf Science,*** 2013, 131: 24-30.

In the Changjiang Estuary, interactions between the sea and the river result in the development of a turbidity maximum zone (TMZ). Riverine sediments are an important source for TMZ formation. Since the 1960s, sediment discharge from the river basin to the estuary has decreased due to dam construction, water and soil conservation, and water diversion projects. Thirty-two Landsat images of the estuary, covering the period from 1979 to 2008, were collected to identify the TMZ response to sediment decline. A threshold value of suspended sediment concentration (SSC) of 0.7 kg/m^3, corresponding to a spectrum reflectance of 5% of Landsat MSS band 7 and 7% of Landsat TM/ETM band 4, was used to identify the Changjiang Estuary TMZ. The TMZ area was then extracted from each image to investigate its temporal and spatial variations during the past 30 years. The images were grouped into five time series; the average TMZ area of each series

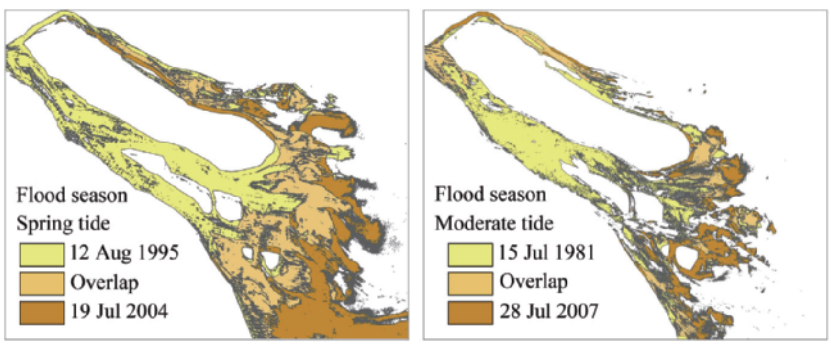


Fig. 3. The distribution of the TMZ changed in the past decades.

was estimated. The results show that the TMZ area declined 23% from series (a) to series (e), responding to a 77% reduction in riverine sediment discharge. In addition, the TMZ had strong seasonal and tidal variations; it was generally larger during flood seasons than during dry seasons and during spring tides compared to neap tides. The spring/neap tidal cycle played a more important role in TMZ change than did the seasonal cycle. Due to the continued reduction of sediment discharge to the estuary resulting from dams already constructed and to those that will be constructed upstream in the Changjiang River, it is predicted that the TMZ area will continue decreasing and that the re-suspension of local sediments will play a more important role in the formation of the TMZ.

Spatial variability in the abundance, composition and age of organic matter in surficial sediments of the East China Sea.

Wu, Y., Eglinton, T., Yang, L.Y., Deng, B., Montlucon, D., Zhang, J., ***Journal of Geophysical Research-Biogeosciences,*** 2013, 118(4): 1495-1507.

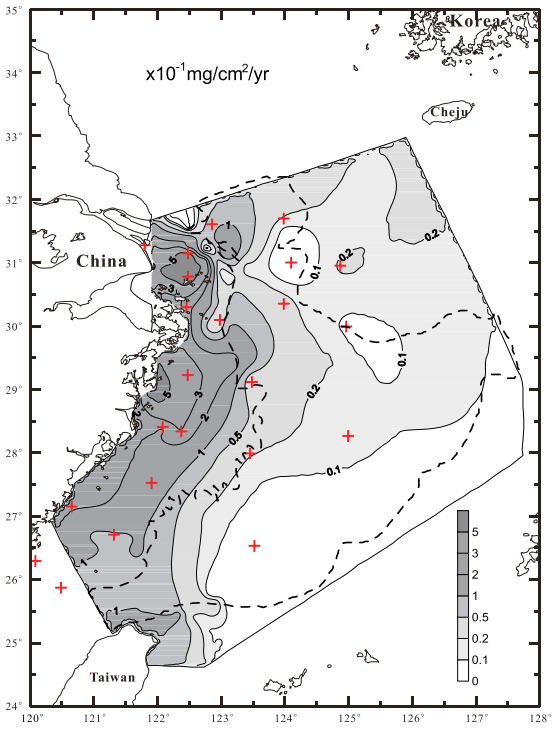
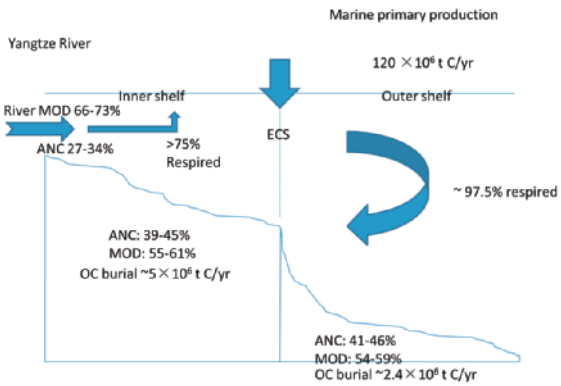


Fig. 5. Spatial distribution of lignin flux over the ECS.



Understanding the sources and fate of organic matter (OM) sequestered in continental margin sediments is of importance because the mode and efficiency of OM burial impact the carbon cycle and the regulation of atmospheric CO_2 over long time scales. We carried out molecular (lignin-derived phenols from CuO oxidation), elemental, isotopic ($\delta^{13}C$, $\Delta^{14}C$), and sedimentological (grain size and mineral surface area) analyses in order to examine spatial variability in the abundance, source, age of surface sediments of the East China Sea. Higher terrigenous organic matter values were found in the main accumulating areas of fluvial sediments, including the Changjiang (Yangtze) Estuary and Zhejiang-Fujian coastal zone. Isotopic and biomarker data suggest that the sedimentary OM in the inner shelf region was dominated by aged ($\Delta^{14}C$ = -423 ± 42‰) but relatively lignin-rich OM (Λ = 0.94 ± 0.57 mg/100 mg OC) associated with fine-grained sediments, suggesting important contributions from soils. In contrast, samples from the outer shelf, while of similar age (Δ^{14} C = -450 ± 99‰), are lignin poor (Λ = 0.25 ± 0.14 mg/100 mg OC) and associated with coarse-grained material. Regional variation of lignin phenols and OM ages indicates that OM content is fundamentally controlled by hydrodynamic sorting (especially, sediment redistribution and winnowing) and in situ primary production. Selective sorption of acid to aldehyde in clay fraction also modified the ratios of lignin phenols. The burial of lignin in East China Sea is estimated to be relatively efficient, possibly as a consequence of terrigenous OM recalcitrance and/or relatively high sedimentation rates in the Changjiang Estuary and the adjacent Zhejing-Fujian mud belt.

Fig. 7. The estimated budget of modern and ancient carbon in inner and outer shelf of the ECS. Data derived from Deng et al. [2006], Wu et al. [2007], Liu et al. [2011], and this study.

Land-sea intractions at the east coast of Hainan Island, South China Sea: A synthesis.

Zhang, J., Wang, D.R., Jennerjahn, T., Dsikowitzky, L., ***Continental Shelf Research,*** 2013, 57(Special Issue: SI): 132-142.

The structure and function of coastal ecosystems is affected by land-based human activities, including changes in water, sediment and pollutant input, as well as land reclamation in coastal areas. Many coastal areas can be considered over-stressed systems as a whole, the ecosystem services of which are strongly impaired. This is particularly important in tropical regions, where the coastal zone is under the influence of a strong climate variability including monsoons and frequent extreme weather events, such as typhoons. During the past decades the continuous development of Hainan's coastal zone and its hinterland, in combination with episodic natural events (e.g., typhoons), caused environmental changes in its coastal ecosystems. However, little is known on the consequences of environmental changes for the biogeochemistry and ecology and, hence, the natural resources of the Hainan coastal ecosystems. The Sino-German inter-disciplinary LANCET (land–sea interactions along coastal ecosystems of tropical China: Hainan) project was designed to address these issues on a local to regional scale and at the same time, to contribute to the global data base in which this type of information from tropical regions is still under-represented. The results obtained from LANCET have been delivered to the local government for an adaptive management at the ecosystem level, and the knowledge is believed to be relevant to other studies of tropical and coastal regions.

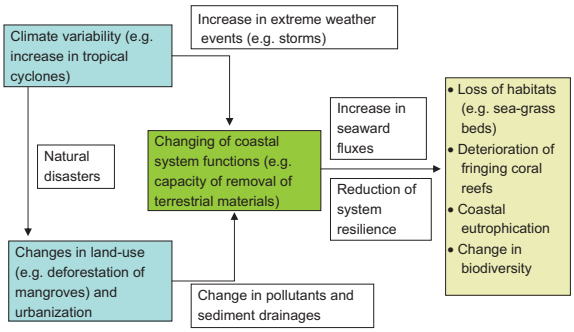


Fig. 10. Conceptual illustration showing how the coastal ecosystems off the East Hainan have been impacted upon by climate variability and human activities. In the Figure, light blue boxes indicate external forcings, the green box means ecosystem response, the yellow box shows the expected consequences to the coastal environment, whilst the white boxes display the known mechanism through which the impact can produce a result. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

Sedimentation processes in silt-rich sediment systems.

te Slaa, S., He, Q., van Maren, D.S., Winterwerp, J.C., ***Ocean Dynamics,*** 2013, 63(4): 399-421.

Sediment found in China's Yangtze and Yellow River systems is characterized by large silt fractions. In contrast to sand and clay, sedimentation and erosion behavior of silt and silt–clay–sand mixtures is relatively unknown. Therefore, settling and consolidation behaviour of silt-rich sediment from these river systems is analysed under laboratory conditions in specially designed settling columns. Results show that a transition in consolidation behavior occurs around clay contents of about 10 %, which is in analogy with the transition from non-cohesive to cohesive erosion behaviour. Above this threshold, sediment mixtures consolidate in a cohesive way, whereas for smaller clay percentages only weak cohesive behaviour occurs. The settling behaviour of silt-rich sediment is found to be in analogy with granular material at concentration below 150 g/l. Above 150–200 g/l, the material settles in a hindered settling regime where segregation is limited or even prevented. The results indicate that for modelling purposes, multiple sediment fractions need to be assessed in order to produce accurate modelling results.

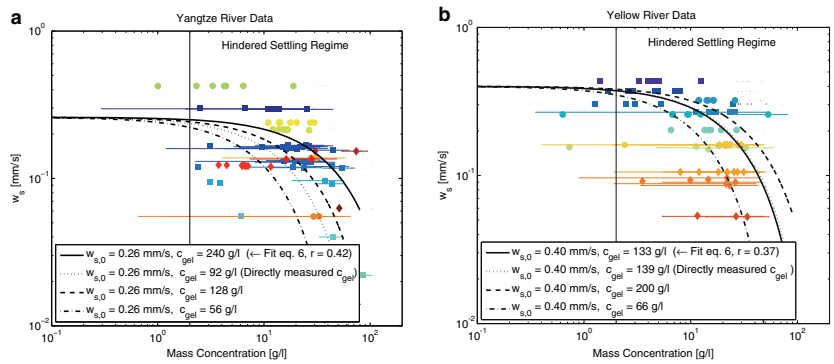


Fig. 11. Observed still water settling velocities of flocculated material as function of the measured sediment concentration in Yangtze Estuary columns (a) and Yellow River Columns (b). *Varying colors* represent different test series, whereas shape variations represent different columns

Impact of monsoon-driven circulation on phytoplankton assemblages near fringing reefs along the east coast of Hainan Island, China.

Li, Y., Wang, D.R., Su, J., Zhang, J., ***Deep-Sea Research II,*** 2013, 96: 75-87.

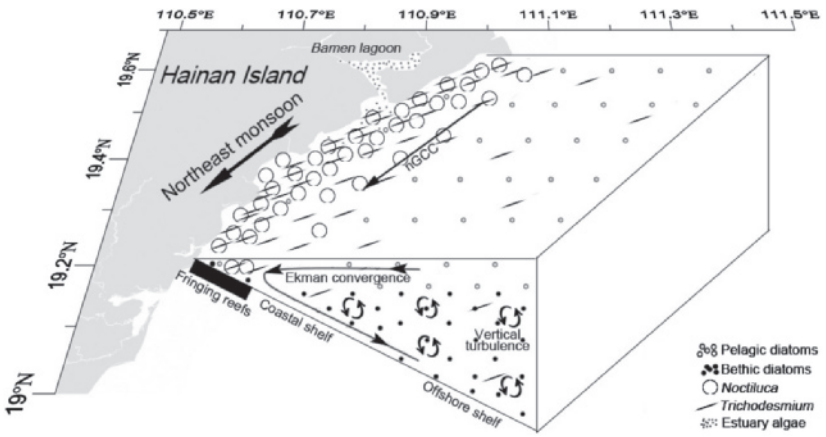


Fig. 8. Conceptual diagram about the construction of monsoonal hydrodynamic on phytoplankton assemblages near fringing reefs at the east coast of Hainan Island during the NEM cruise. The nGCC entrained coastal phytoplankton assemblages (big celled *N. scintillans* and sparse diatoms) of the eutrophic South China mainland coast to the east coast of Hainan Island, and onshore Ekman transport process entrained offshore phytoplankton assemblage (*sparse T. erythraeum* and diatoms/dinoflagellates) to the east coast of Hainan Island. Furthermore, the pelagic *N. scintillans* cells and *T. erythraeum* trichomes onshore aggregated and formed high abundances at fringing reefs along the coastline, so as to form the *N. scintillans* blooms.

Monsoonal hydrodynamic prevails over the east coast of Hainan Island induced by southwest monsoon (SWM) and northeast monsoon (NEM) which drives coastal Ekman divergence/convergence cycle and the reversal of Guangdong coastal current (GCC) between the sGCC in the SWM season and nGCC in the NEM season. We report the control of such hydrodynamics on biological properties such as phyto- plankton assemblages in the east coast of Hainan Island. Physico-chemical and biological observations were carried out in two oceanographic cruises along the east coast of Hainan Island during SWM period (July–August) of 2008 and NEM period (March–April) of 2009. Results indicated that phytoplankton assemblages in coastal regions (fringing reefs and coastal shelf) changed dramatically accompanied with the reverse of monsoonal hydrodynamic processes, with chain-forming diatoms (mainly, *Pseudo-nitzschia* spp. and *Thalassionema nitzschioides*) dominating during SWM cruise when coastal Ekman divergence and the sGCC were prevailed, but the pelagic *Noctiluca scintillans* and *Trichodesmium erythraeum* dominating during NEM cruise when coastal Ekman convergence and then GCC were prevailed. Furthermore, phytoplankton assemblages in fringing reefs along coastline were somewhat different from ones of coastal shelf, as fringing reefs are just located at dynamic boundary of offshore (or onshore) Ekman transport processes. Offshore diffusion of pelagic cells (such as *T.erythraeum*) driven by offshore Ekman transport process led to the lower abundance of *T.erythraeum* in fringing reefs than ones in coastal shelf during SWM cruise; on the contrary, on shore aggregation of pelagic cells (such as *N. scintillans* and *T.erythraeum*) driven by on shore Ekman transport process leads to higher abundances of *N. scintillans* and *T.erythraeum* in fringing reefs than ones in coastal shelf during NEM cruise; especially, *N. scintillans* formed bloom in fringing reefs. Last, we suggested that hydrodynamic processes must be taken into account in scientific management of fringing coral reefs health of the east coast of Hainan Island, especially during northeast monsoon season when blooming specie cells (such as *N. scintillans*) could be introduced from eutrophic South China main land coast to the east coast of Hainan Island and piled to high-abundance at fringing reefs by monsoonal hydrodynamics.

Nutrient fluxes via radium isotopes from the coast to offshore and from the seafloor to upper waters after the 2009 spring bloom in the Yellow Sea.

Su, N., Du, J.Z., Liu, S.M., Zhang, J., ***Deep-Sea Research II,*** 2013, 97: 33-42.

The horizontal and vertical transport of nutrient-rich water both from the coast and from the seafloor to the overlying water column should play an important role in supplying nutrients required for the periods of vegetative or reproductive growth of phytoplankton. In the present work, radium isotopes (^{223}Ra, ^{224}Ra and ^{226}Ra) in the southern Yellow Sea were measured after a spring bloom in June 2009. The exponential-like decrease of ^{223}Ra away from the coast to offshore waters yielded horizontal eddy diffusivities (*Kh*) of (2.93±1.47)×10^{7} cm^{2} s^{-1} by neglecting the advection. This estimate was smaller than that with advection indicator by as much as 21% when using an analytic model for ^{223}Ra and ^{226}Ra. The corresponding horizontal nutrient fluxes were 1525 μmol m^{-2} d^{-1} (DIN), 15.9 μmol m^{-2} d^{-1} (DIP) and 826 μmol m^{-2} d^{-1} (DSi), which would supply around 16% of N and 3% of P requirements based on the primary productivity. The decrease of ^{224}Ra and ^{223}Ra activities from sediments to the upper water column suggests the vertical eddy diffusion coefficient (*Kz*) of 6.23±5.58 cm^{2} s^{-1} below the thermocline, which was within the Yellow Sea Cold Water Mass (YSCWM). The calculated vertical fluxes of nutrient were 4945 μmol m^{-2} d^{-1} (DIN), 236 μmol m^{-2} d^{-1} (DIP) and 5315 μmol m^{-2} d^{-1} (DSi), accounting for up to 52% of N and 40% of P requirements for the phytoplankton growth. These results demonstrate the role of YSCWM as a relative nutrient-rich pool for the supply of nutrient to the southern Yellow Sea via the vertical diffusion process relative to the horizontal process during the summer season. Such processes will be strengthened during the weak density stratification in spring when algal blooms occur.

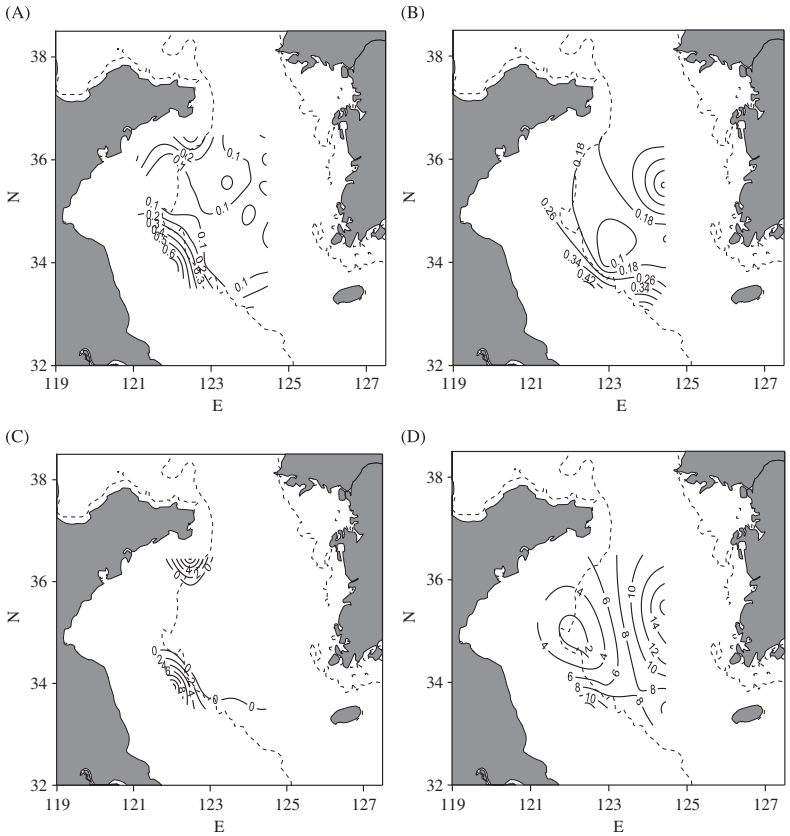


Fig. 3. Contour plots of ^{223}Ra and ^{224}Ra (dpm 100 L^{-1}) in surface and near bottom waters. (A) ^{223}Ra-surface, (B) ^{223}Ra-bottom, (C) ^{224}Ra-surface, (D) ^{224}Ra-bottom.

Distribution patterns of particle-reactive radionuclides in sediments off eastern HainanIsland, China: Implications for source and transport pathways.

Huang, D.K., Du, J.Z., Deng, B., Zhang, J., ***Continental Shelf Research,*** 2013, 57(Special Issue: SI): 10-17.

The study of sediment sources and transport processes from land to ocean can help in predicting the fate of the pollutants released from land or the potential change in sediment delivery to coastal areas and/or open oceans. The activities of ^{7}Be, excess ^{210}Pb (^{210}Pbxs), excess ^{234}Th (^{234}Thxs) and ^{137}Cs in surface sediments collected offshore of eastern Hainan Island, China, in August of 2008 were measured by an HPGe γ-spectrometer to evaluate the sediment source and transport processes. The results showed that all the surface sediments were silt or sand, and the mean grain sizes of the northern locations were higher than those in the other regions. The ranges of activities of ^{7}Be, ^{210}Pbxs, ^{234}Thxs and ^{137}Cs in surface sediment were 0.14–12.7, 37.4–199, 2.24–176 and 0.02–1.06 Bqkg^{-1}, with averages of 3.78±4.77, 110±8.1, 66.7±8.9 and 0.52±0.22 Bq kg^{-1}, respectively. The activities of the radionuclides increased from coast to offshore in the northern section. The upwelling may cause high particle fluxes with high activities of ^{210}Pbxs and ^{234}Thxs. A comparison of the source and transport of the suspended sediments with river discharge along the coast shows that the coastal current and offshore upwelling are the dominant factors for the transport and sources of surface sediment in the study region. The sediment was transported from south to north by the coastal current, and sediments with a large grain size maybe deposited via the north loop current. The ratios of the nuclide activities indicated that the suspended particles need approximately one year to be removed from the water column into the seabed and that the main source of the sediments off eastern Hainan Island in the study regions was terrigenous deposits.

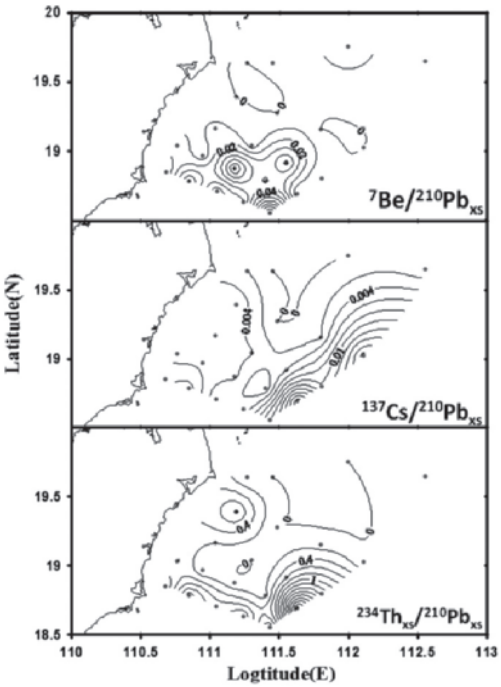


Fig. 5. Activity ratios of the radionuclides of the surface sediments off eastern Hainan Island.

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

Antibiotics in the surface water of the Yangtze Estuary: occurrence, distribution and risk assessment.

Yan, C.X., Yang, Y., Zhou, J.L., Liu, M., Nie, M.H., Shi, H., Gu, L.J., ***Environmental Pollution,*** 2013, 175: 22-29.

The occurrence and distribution of five groups of antibiotics were investigated in the surface water of Yangtze Estuary over four seasons. Of the 20 antibiotics, only sulfamerazine was not detected at all sampling sites, indicating widespread occurrence of antibiotic residues in the study area. Detection frequencies and concentrations of antibiotics were generally higher in January, indicating that low flow conditions and low temperature might enhance the persistence of antibiotics in water. Antibiotic levels varied with location, with the highest concentrations being observed around river discharge and sewage outfall. Furthermore, a positive correlation between total antibiotic and DOC concentrations revealed the significant role played by DOC. Risk assessment based on single compound exposure showed that sulfapyridine and sulfamethoxazole could cause medium risk to daphnid in the Yangtze Estuary.

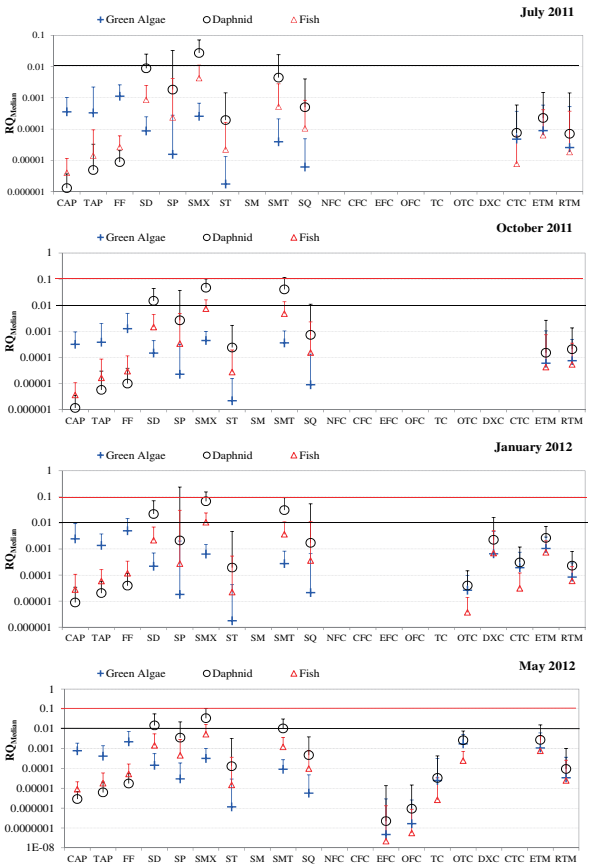


Fig. 4. Risk assessment of antibiotics in the surface water of the Yangzte Estuary from July 2011 to May 2012. The different symbols represent the median RQ values for the three different organisms, while the bars represent the maximum RQ values for those organisms.

Surface functionalized gold nanoparticles for drug delivery.

Cheng, J.P., Gu, Y.J, Cheng, S.H., Wong, W.T. ***Journal of Biomedical Nanotechnology,*** 2013, 9 (8): 1362-1369.

Gold nanoparticles have been widely explored as cancer therapeutics and diagnostic agents in recent years. With their unique subcellular size and good biocompatibility, gold nanoparticles are a promising drug delivery vehicle. In this study, folic acid-coated gold nanoparticles conjugated with fluorophore FITC through amine terminated poly (ethylene glycol) were prepared and confocal microscopy together with bright-field differential interference contrast imaging data showed that folic acid-coated gold nanoparticles accumulated mainly in cytoplasm of primary human fibroblasts, without causing any observable cytotoxicity upon exposure for 48 hours. Through the further

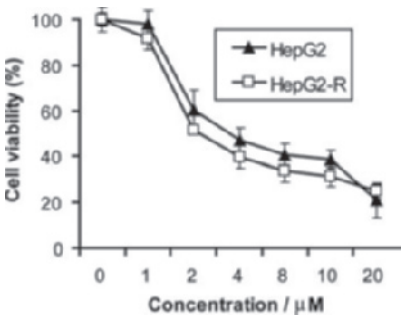


Fig. 7. Cell viability of Au-SMCC-DOX to drug-sensitive HepG2 cells and its multidrug-resistant strain HepG2-R. The concentration is the concentration of DOX in the Au-SMCCDOX complexes. Cytotoxicity of Au-SMCC-DOX nanoconjugates to HepG2 (triangle) and HepG2-R (square) cells after exposure for 24 h. Cell viability was measured by MTT assay. The results were expressed as viability (%) relative to a control without any treatment. Results are expressed as means ± standard error from 3 different independent experiments.

development of a drug delivery system that conjugates doxorubicin onto the surface of gold nanoparticles with a poly (ethylene glycol) spacer via an SMCC linker, we demonstrated that multidrug resistance in cancer cells can be significantly overcome by a combination of highly efficient cellular entry and enhanced cytotoxicity of Au-SMCC-DOX nanoconjugates, as revealed both by confocal microscopy imaging and cytotoxicity assay. The prepared Au-SMCC-DOX nanoconjugates demonstrated enhanced drug accumulation and retention in multidrug resistant hepG2-R cancer cells when it was compared with free doxorubicin, with a cytoplasm accumulation profile. The results indicated that gold nanoparticles are a kind of promising drug delivery vehicle with good biocompatibility and suitable for further applications in drug delivery for improved chemotherapy, especially for overcoming multidrug resistance.

Matrix effect in high-performance liquid chromatography-tandem mass spectrometry analysis of antibiotics in environmental water samples.

Zhou, J.L., Kang, Y.H., ***Journal of Separation Science,*** 2013, 36(3): 564-571.

This paper describes the matrix effect during the analysis of ten antibiotic compounds in water by SPE followed by HPLC-ESI-MS/MS. The target analytes were tetracycline, oxytetracycline (tetracyclines), sulfathiazole, sulfamethazine, sulfadiazine (sulfonamides), erythromycin-H_2O, roxithromycine, spiramycin (macrolides), ofloxacin, and norfloxacin (quinolones). The matrix effect was examined for internal standards and the target analytes in five different water matrixes, with signal suppression being increased in the order: ultrapure water, tap water, river water, sewage effluent, and sewage influent. A combined application of the internal standards and matrix-matched extract calibration was shown to be successful in compensating the matrix effect for the analytes. The procedural recovery of the target compounds in sewage effluents and influents was higher than in river water samples, which was further enhanced by sample acidification to pH 2. The validity of the internal standard based matrix-matched calibration approach was verified by the standard addition method.

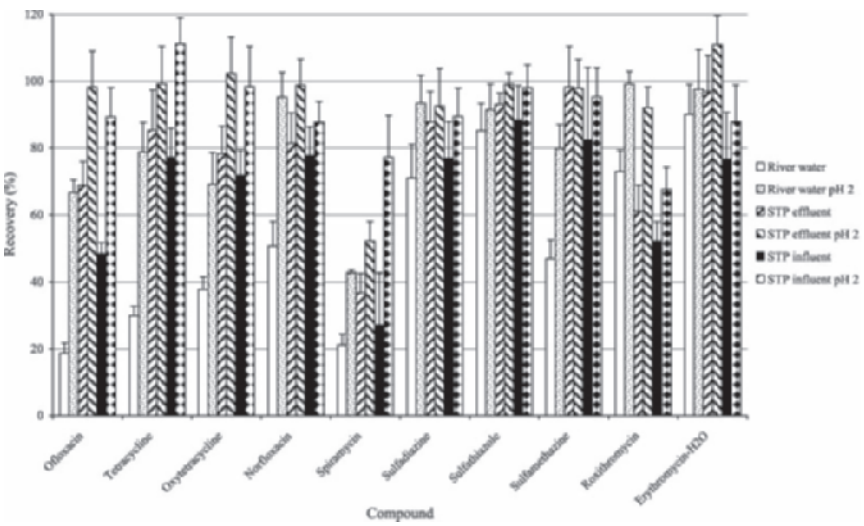


Fig. 4. Average recovery (±SD, n = 5) of antibiotics in river water, sewage effluent, and sewage influent samples, before and after sample acidification to pH 2, at a spiking concentration of 50 ng/L.

Nutrient inputs to a Lagoon through submarine groundwater discharge: The case of Laoye Lagoon, Hainan, China.

Ji, T., Du, J.Z., Moore, W.S. Zhang, G.S., Su, N., Zhang, J., ***Journal of Marine Systems,*** 2013, 111: 253-262.

Submarine groundwater discharge (SGD) with inputs of nutrients in certain regions may play a significant role in controlling water quality in the coastal regions. In this paper, we have determined four naturally occurring radium isotope (^{223}Ra, ^{224}Ra, ^{226}Ra and ^{228}Ra) activities and nutrient concentrations in surface water, coastal groundwater and river water in the mixing zone of Laoye Lagoon to estimate the fluxes of SGD by several models. The activities of the four radium isotopes of ground water were considerably greater than those in surface water samples. Using a ^{224}Ra/^{228}Ra activity ratio (AR) model, we estimated the average lagoon water age to be 3.2 days, which was comparable with the flushing time of 4.0 days. Based on the excess radium isotopes and the water age of the lagoon, the estimated fluxes of SGD (in 10^6 m^3/d) ranged from 2.64 to 5.32 with an average of 4.11. Moreover, we

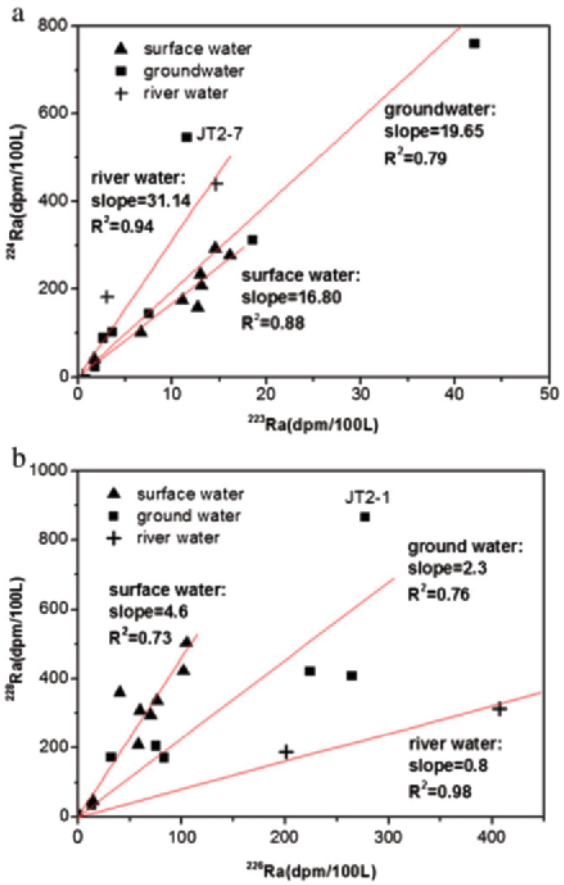


Fig. 4. Plot of (a) ^{224}Ra vs ^{223}Ra, (b) ^{228}Ra vs ^{226}Ra for all samples: surface water (▲); groundwater (■); and river water (+).

used Si balance to evaluate the flux of SGD (4.8×10^6 m^3/d) which was close to the result calculated by radium. The SGD-derived nutrient fluxes (in mol/d) were DIN=1.7×10^5, PO_4^{3-}=5.2×10^2, and SiO_3=5.3×10^4. Furthermore, we applied the biogeochemical budget approach using SiO_3 as a tracer to evaluate the impact of SGD. The differences between the results estimated by radium and SiO_3 may indicate different pathways for the input of nutrients.

Effects of lead stress on anti-oxidative enzymes and stress-related hormones in seedlings of *Excoecaria agallocha* Linn.

Yan, Z.Z., Tam, N.F.Y., ***Plant and Soil,*** 2013, 367(1-2): 327-338.

Background and Aims This study aimed to evaluate the responses of anti-oxidative enzymes and stressrelated hormones in *E. agallocha* to different levels of Pb stresses at different exposure time.

Methods The study was carried out in greenhouse, and the pot trials were conducted to investigate the stress responses of root and leaf to Pb exposure in seedlings of *E. agallocha.*

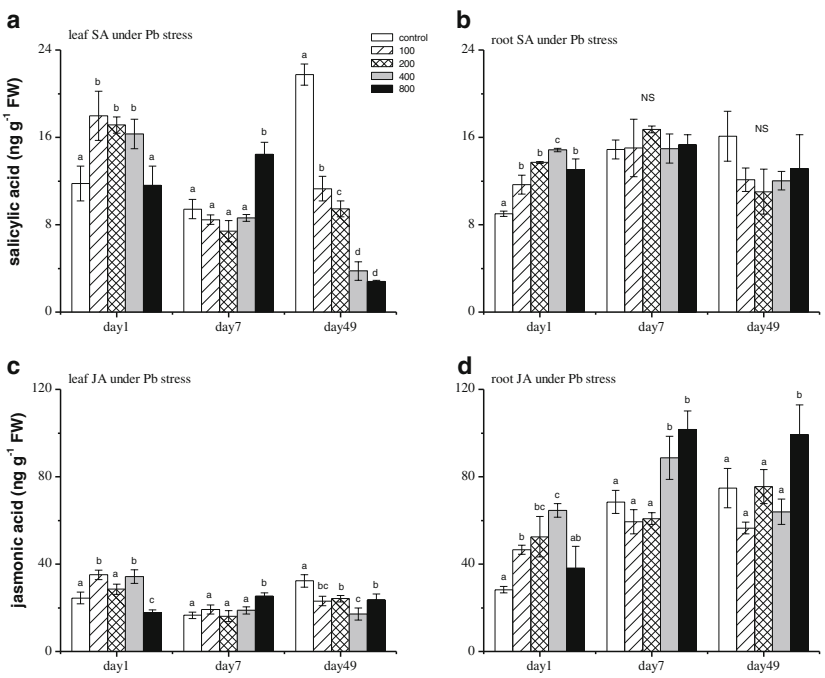


Fig. 4. SA and JA concentrations in leaf and root of *E. agallocha* at different treatment times under different levels of Pb (Mean and SD of three replicates are shown; at each treatment time, bars with different letters are significantly different at P ≤ 0.05; no letters are shown if the data are not significantly different at P≤0.05; NS not significant)

Results Pb stress posed higher toxic effects on root than leaf at day 49. At days 1, 7and 49, the activities of superoxide dismutase and peroxidases increased significantly, especially in leaves. Significant increases of malondialdehyde content were also observed at day 1 but significant increases of proline were only found at day 49 in leaf. Increases of salicylic acid and jasmonic acid were mainly observed in the leaves at day 1.

Conclusions E. agallocha was sensitive to Pb stress and damages, but tended to acclimate to low levels of Pb stresses by increasing and maintaining high levels of SOD and POD activities even at the later stage of exposure (day 49). Increases of endogenous SA and JA concentrations at day 1 might also involve in the plant's tolerance to Pb stress.

Differences in lead tolerance between *Kandelia obovata* and *Acanthus ilicifolius* seedlings under varying treatment times.

Yan, Z.Z., Tam, N.F.Y., ***Aquatic Toxicology,*** 2013, 126: 154-162.

The effects of short-term (1 day) and long-term (49 days) of lead (Pb) stress on growth and physiolog-ical responses in the leaves and roots of two mangrove plants, *Kandelia obovata* and *Acanthus ilicifolius*, were compared. The growth of both species was affected by Pb at Day 49, whereas the root to shoot ratio of *K. obovata* remained unchanged. Compared with *A. ilicifolius*, less Pb accumulated in leaves of *K. obovata,* which indicates that this species is a typical Pb-excluder. Significant linear relationships were observed between the Pb concentrations in the roots and leaves and the Pb treatment concentrations in the sediments in *A. ilicifolius* but not in *K. obovata*. The proline concentration increased in both mangrove species at Day 49, especially in *A. ilicifolius,* but no changes were observed at Day 1. The tolerant species *K. obovata* tended to acclimate to metal stress by restricting the translocation of toxic metals and by increasing and/or maintaining high superoxide dismutase (SOD) activity, minimizing lipid peroxidation, and exhibiting prolonged unaltered growth (49 days) under Pb treatment. The non-tolerant species, *A. ilicifolius*, did not acclimate to metal stress, its leaves were seriously damaged with significant increased MDA content, and its SOD activity was decreased. An increase of endogenous jasmonic acid concentration was observed only in *K. obovata*, both at Day 1 and at Day 49, which suggests that this hormone plays an important role in metal tolerance under short-term and long-term metal treatment.

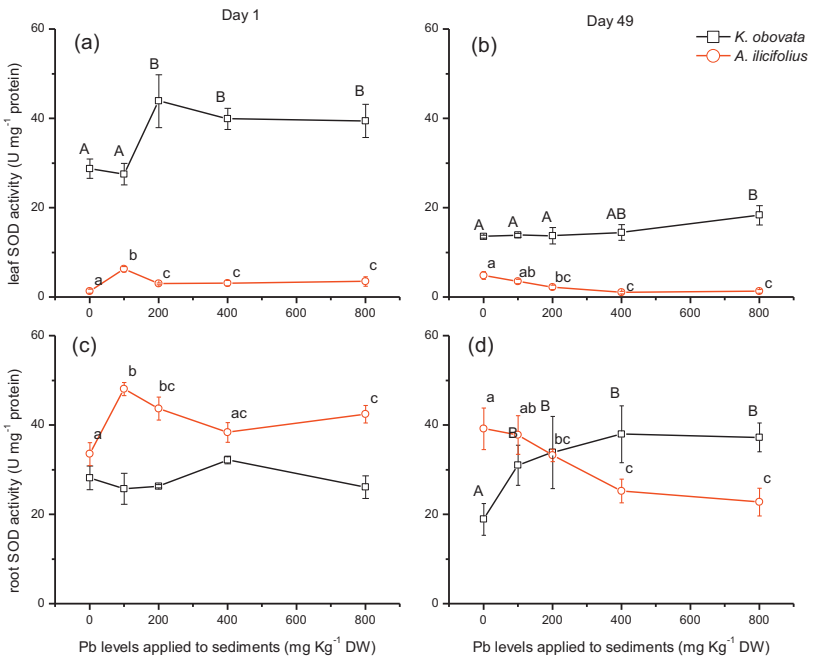


Fig. 4. SOD activities in leaves and roots of *K. obovata* and *A. ilicifolius* at Days 1 and 49 under different levels of Pb treatments. (a) Leaf SOD at Day 1; (b) leaf SOD at Day 49; (c) root SOD at Day 1; (d) root SOD at Day 49 (mean and SD of three replicates are shown; at each treatment time, data with different letters are significantly different at $P \leq 0.05$; no letters appended if the data are not significantly different).

Methyl jasmonate as modulator of Cd toxicity in *Capsicum frutescens* var. fasciculatum seedlings.
Yan, Z.Z., Chen, J., Li, X.Z., ***Ecotoxicology and Environmental Safety,*** 2013, 98: 203-209.

Methyl jasmonate (MeJA) elicits protective effects as form of plant response to abiotic stress. However, related studies on plant response to metal stress are insufficient. This study aimed to examine the effects of MeJA on growth and physiological responses of *Capsicum frutescens* seedlings exposed to cadmium (Cd) stress. The study was performed in an artificial climate chamber. Results showed that 50mgL^{-1} Cd significantly impaired the growth of the seedlings by increasing leaf MDA content and decreasing chlorophyll *b*. These effects were significantly mitigated by MeJA at low concentrations (0.1 mmol L^{-1}). The dry weights of different plant parts, chlorophyll content, and leaf catalase and ascorbate peroxidase activities were increased by a low MeJA concentration (0.1 mmol L^{-1}) but were decreased by a high MeJA concentration (1000 mmol L^{-1}). Significant increases in endogenous jasmonic acid were observed at 48h after the samples were treated with Cd and 0.1 mmol L^{-1} MeJA. These results suggested that low exogenous MeJA concentrations exhibited protective effects on the growth and physiology of *C. frutescens* seedlings under Cd stress.

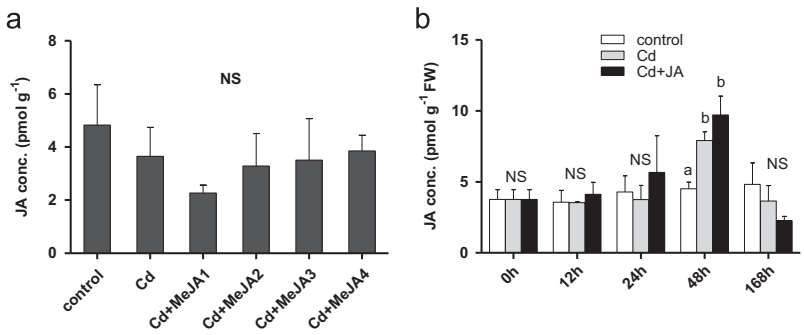


Fig. 4. Changes of JA concentrations in leaf of *C. frutescens* seedlings (a) under different treatments of Cd (50mgL^{-1}) and MeJA (0.1, 1, 10 and 1000 μmol L^{-1} for MeJA 1, 2, 3 and 4, respectively) at day 7, and (b) at different time after the treatments (values are mean and SD; bars with different letters are significantly different at P≤0.05; for time series changes of JA, statistical was made in separate groups of time, NS indicates not significant).

A process-based grid model for the simulation of range expansion of *Spartina alterniflora* on the coastal saltmarshes in the Yangtze Estuary.
Ge, Z.M., Cao, H.B., Zhang, L.Q., ***Ecological Engineering,*** 2013, 58: 105-112.

Spartina alterniflora has been widely introduced to many coastal and estuarine regions of the world as a species for ecological engineering and this species has been spreading rapidly and widely along the Chinese coastline for the past 30 years. Based on four years of field measurements at the Chongming Dongtan wetland in the Yangtze Estuary, a process-based grid model of spatio-temporal range expansion for *S. alterniflora* was developed. The model incorporated the seasonal patterns of seed bank dynamics, seedling establishment, clonal propagation and vegetative growth, while also considering the effects of hydrodynamic conditions on the range expansion of *S. alterniflora* in the coastal saltmarshes. Modelling of a survey strip over a single year on the Dongtan wetland showed that the simulated spread pattern agreed with the actual pattern recorded during the growing season (March–September) with an accuracy of 90–95%, based on the estimations of seed bank dynamics and seedling establishment. On a wider spatio-temporal scale, an 8 year simulation showed that the patterns of range expansion of *S. alterniflora* are amenable to spatially-explicit modelling that takes

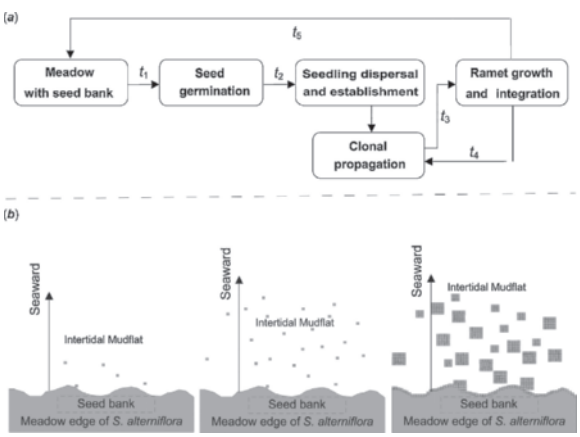


Fig. 2. Scheme of the model simulation process (a) with the life cycle of *S. alterniflora* and (b) its spatial spread mode.

spatio-temporal processes into account, mainly due to the aggregation effects of clonal integration in patches. Hydrodynamic conditions and niche availability were the most important factors controlling the expansion rate of *S. alterniflora* on the seaward expansion front. However, the actual expansion rate of *S. alterniflora* has slowed down in recent years due to the reduction in the sediment load of the Yangtze River following the completion of the Three Gorges Dam Project. There remain several uncertain issues relating to the model setup and its predictive capacity in terms of environmental variability and the stochasticity that is inherent in the modelling of the reproduction, dispersal and survival of *S. alterniflora.* Furthermore, an update of the model is needed linked to the sediment dynamics seasonality of hydrodynamic conditions in the Yangtze Estuary. In conclusion, this modelling approach provided valuable insights into the life-cycle mechanisms and range expansion processes of *S. alterniflora* under the current conditions. We suggest the potential application of this model in comparing various control strategies.

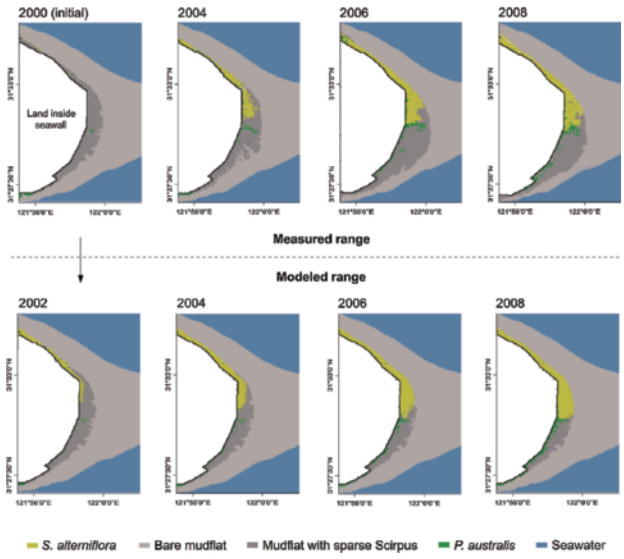


Fig. 6. The observed (upper panel) and modelled (bottom panel) spatial-temporal range expansions of *S. alterniflora* on the Chongming Dongtan wetland (location refer to Fig. 1) over the period of 2000–2008. The observed data of 2004, 2006 and 2008 were produced through vegetation classification with remote sensing images.

Analyzing the spectral response of submerged aquatic vegetation in a eutrophic lake, Shanghai, China.
Zou, W.N., Yuan, L., Zhang, L.Q., ***Ecological Engineering,*** 2013, 57: 65-71.

Re-establishment of submerged aquatic vegetation (SAV) has been recognized as a valuable approach to ecological engineering for the restoration of eutrophicated lakes. Remote sensing technology can be used to monitor the distribution and abundance of SAV through time on a large scale. However, the radiation reflected

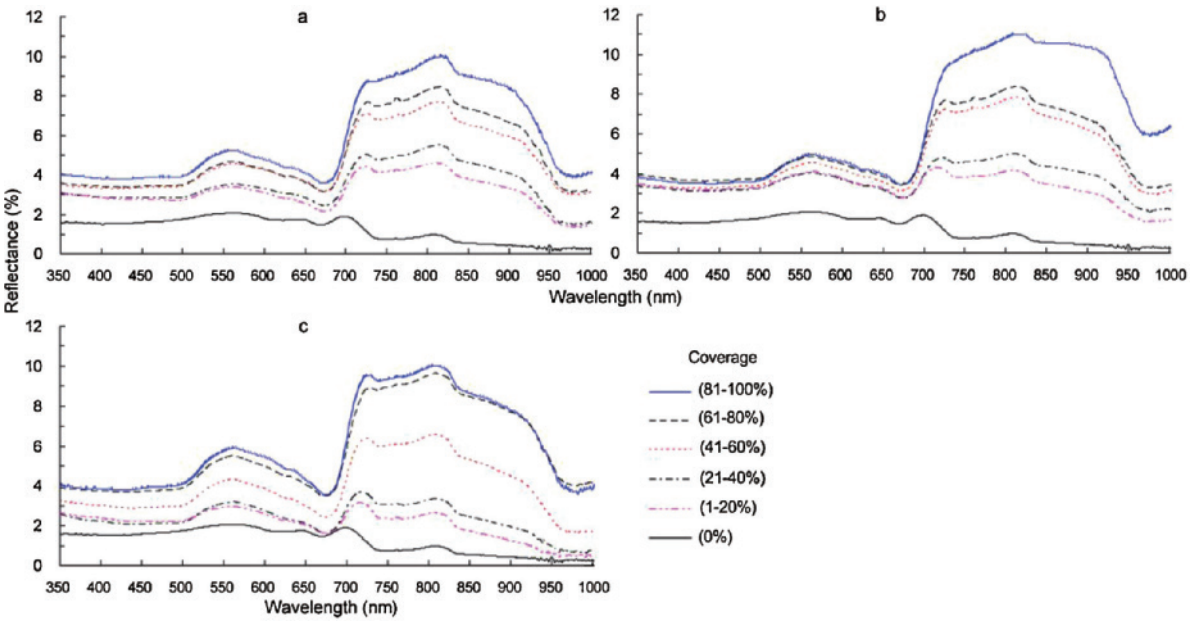


Fig. 2. Mean spectral reflectance curves for the varying coverage of (a) P. crispus, (b) M. spicatum and (c) P. malaianus.

from SAV must cross the air–water interface and certain optically active components in the water column, such as the depth from the water surface to the plant canopy (WDC), the algal chlorophyll content (Chla), the suspended content (SC) and the water transparency (WT), may alter the spectral signal of the SAV, resulting in inaccuracies in the interpretation of the related remote sensing images. In this study, the spectral characteristics of the SAV plant species Potamogeton crispus, Myriophyllum spicatum and Potamogeton malaianus with varied coverage and water conditions were measured in situ using a spectroradiometer in a eutrophic lake near Shanghai, China. The results showed that the spectral reflectance for varying coverages of SAV appeared mainly within the wavebands 700–900 nm. Canonical correspondence analysis (CCA) ordination based on the reflectance data within the 700–900 nm wavelength bands for 261 quadrats of *P. crispus, M. spicatum* and *P. malaianus* together with the variables of coverage, WDC, Chla, SC and WT indicated that the coverage of SAV and WDC were the most important factors affecting the spectral characteristics of SAV. The first derivative curves showed the differences in the position of the peak and valley of spectral reflectance among SAV species. Based on the results from this study, a two-independent variable regression model was established, which predicted the coverage of SAV effectively in the field, in conjunction with variations in water conditions. The implications of these results, in terms of the ability of relevant remote sensing to estimate and monitor the distribution and dynamics of submerged aquatic vegetation on a large scale, are discussed.

Adaptive management to climate change for Norway spruce forests along a regional gradient in Finland.
Ge, Z.M., Kellomaki, S., Peltola, H., Zhou, X., Vaisanen, H., ***Climatic Change,*** 2013, 118(2): 275-289.

We hypothesized that the responses of boreal Norway spruce (*Picea abies*) forests to climate change would be region-specific due to regional differences in temperature and water availability. In this context, we analyzed the adaptive effects of varied thinning intensities on the gross primary production (GPP), total stem wood growth, and timber yield over a 100-year period using a process-based ecosystem model. Our simulations represented Norway spruce forests for five different bioclimatic zones spanning southern to northern Finland (61–67°N). Ten thinning regimes with thinning intensities ranging from 5 to 50 %, as well as an unthinned regime, were included in the calculations. The results showed that at the southern sites without thinning, the cumulative GPP and total stem wood growth were lower under the changing climate than in the current climate over the simulation period due to greater water depletion via evapotranspiration and reduced soil water availability. At the central and the northern sites, the climate changes increasingly enhanced the GPP and total stem wood growth due to the mitigation of low-temperature limitation and the improved soil water availability. Thinning generally mitigated the soil water deficit by reducing water evaporation and led to a reduction of the natural mortality. At the southern sites, light and moderate thinning intensities increased the GPP and total stem wood growth relative to sites with a changing climate that experienced no thinning. Moreover, moderate thinning resulted in the greatest timber yield. Heavy thinning, in which a large proportion of standing trees were removed, reduced the GPP and total stem wood growth despite allowing increased soil water availability. At the northern sites, all levels of thinning, including light thinning, decreased the GPP and stem wood growth, indicating that soil water availability was not a limiting factor for growth prior to thinning.

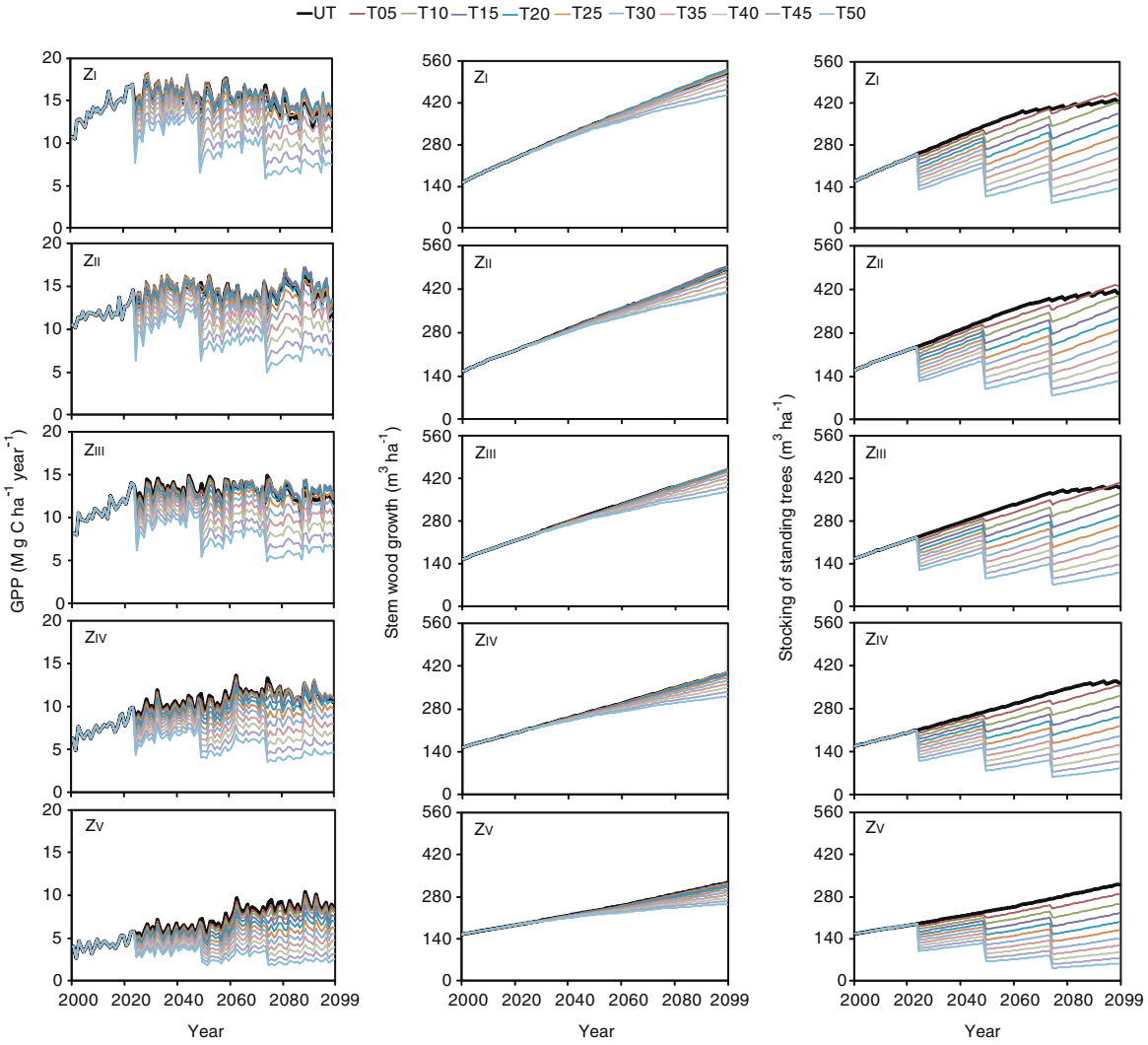


Fig. 3. Variations in the annual GPP (*left panel*), total stem wood growth (*middle panel*) and stocking of standing trees (*right panel*) prior to the final harvest under various thinning regimes at the five sites in response to the changing climate over the 100-year simulation period. UT: unthinned; T05–T50: thinning intensity of 5 %–50 % in each thinning

Effects of land use intensity on soil nutrient distribution after reclamation in an estuary landscape.
Li, X.Z., Sun, Y.G, Mander, U., He, Y.L, ***Landscape Ecology,*** 2013, 28(4): 699-707.

The effects of time on the evolution of land use intensity and soil nutrients distribution were studied in a reclamation zone of the Yangtze Estuary. Land use types were grouped into five intensity levels according to the extent of human disturbance.We used the ‘‘space for time substitution’’ method to test the impact of time on changes in land use intensity after reclamation and found that land use levels increased quickly within the first 35 years, then slowed. Soil salinity was relatively higher in aquaculture ponds than that in areas with other types of land cover due to the use of saline water from underground and the sea. Soil organic matter, available phosphorous and nitrate nitrogen were relatively high in agricultural fields, while nitrate nitrogen was highly variable in agricultural fields. The variations of all four soil properties in the built-up zone were much higher than those in the other land use groups. The spatial distribution of different nutrients is the combined effect of time and land use post reclamation. The results will provide a sound basis for future land use planning of newly reclaimed land, and for further studies on ecological consequences of salt marsh reclamation.

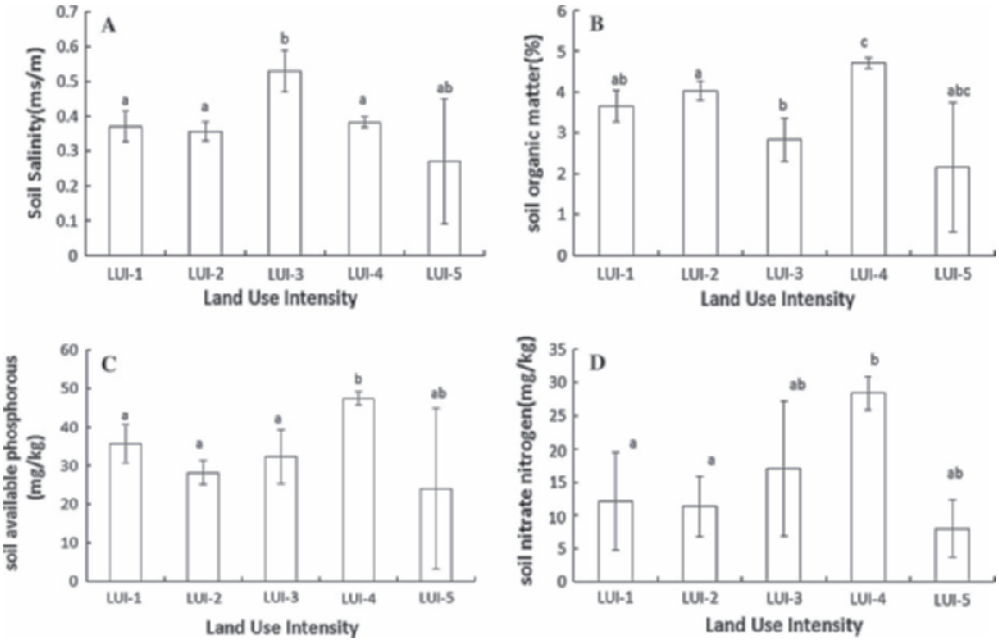


Fig. 5. The relationship between soil properties and land use intensity. The same letters (a, b, c) above the value bars denote no significant difference at $p<0.05$

Perturbation in protein expression of the sterile salmonid hybrids between female brook trout *Salvelinus fontinalis* and male masu salmon Oncorhynchus masou during early spermatogenesis.

Zheng, L., Senda, Y., Abe, S., ***Animal Reproduction Science,*** 2013, 138(3-4): 292-304.

Most males and females of intergeneric hybrid (BM) between female brook trout (Bt) *Salvelinus fontinalis* and male masu salmon (Ms) *Oncorhynchus masou* had undeveloped gonads, with abnormal germ cell development shown by histological examination. To understand the cause of this hybrid sterility, expression profiles of testicular proteins in the BM and parental species were examined with 2-DE coupled with MALDI-TOF/TOF MS. Compared with the parental species, more than 60% of differentially expressed protein spots were down-regulated in BM. A total of 16 up-regulated and 48 down-regulated proteins were identified in BM. Up-regulated were transferrin and other somatic cell-predominant proteins, whereas down-regulated were some germ cell-specific proteins such as DEAD box RNA helicase Vasa. Other pronouncedly down-regulated proteins included tubulins and heat shock proteins that are supposed to have roles in spermatogenesis. The present findings suggest direct association of the observed perturbation in protein expression with the failure of spermatogenesis and the sterility in the examined salmonid hybrids.

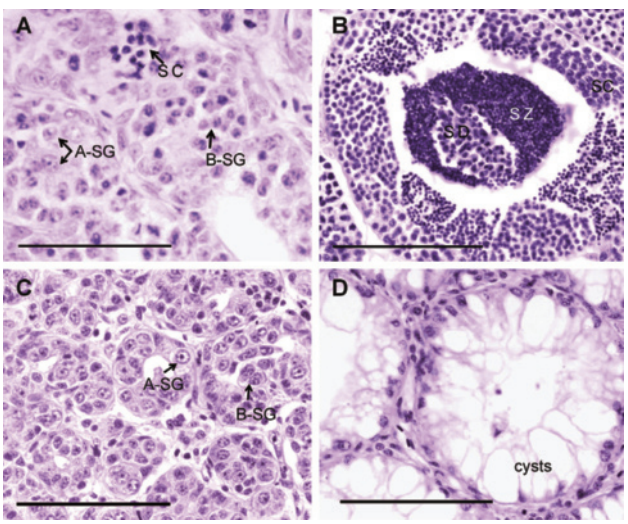


Fig. 2. Representative histological sections of testes from masu salmon (A and B, sampled at spring and summer, respectively), brook trout (C, sampled at spring) and the BM hybrid (D, sampled at spring). SC, spermatocytes; SG, spermatogonia. SD, spermatids; SZ, spermatozoa. The bar represents 100 m.

Particle dynamics of the Changjiang Estuary and adjacent coastal region determined by natural particle-reactive radionuclides (^{7}Be, ^{210}Pb, and ^{234}Th).

Huang, D.K., Du, J.Z., Moore, W.S., Zhang, J., ***Journal of Geophysical Research-Oceans,*** 2013, 118(4): 1736-1748.

The timescale of transport processes in estuarine and coastal regions can be evaluated using natural radionuclides with different half-lives. The distribution patterns of ^{7}Be, ^{210}Pb, and ^{234}Th in the water column from April to July 2008 were used to calculate the removal and residence times in the Changjiang Estuary. The results showed that the maximum particulate activities of ^{7}Be, ^{210}Pb, and ^{234}Th were observed approximately 150 km downstream (the turbidity maximum zone) of the freshwater end-number. The mean distribution coefficients (K_d, cm^3 g^{-1}) of the high suspended particulate matter (SPM) group are higher than those of the lower-SPM group for ^{7}Be and ^{210}Pb; for ^{234}Th, the reverse is true. Based on a material balance in two-dimensional models of ^{7}Be, ^{210}Pb, and ^{234}Th in the Changjiang River mouth, the removal times of these nuclides were approximately 0.66-12, 1.6-21, and 1.2-5.4 days, respectively. The residence times increased toward the seaward side. In the coastal region, the removal times of ^{7}Be, ^{210}Pb, and ^{234}Th calculated by material balance in one dimensional models were approximately 1.1-26, 1.2-27, and 0.70-23 days, respectively. Moreover, an enhanced resuspension process not only controlled the partitioning of ^{7}Be, ^{210}Pb, and ^{234}Th between the particulate and dissolved phases, but also, this process may play a dominant role in controlling the dynamic behavior of SPM in the water column compared with the advection input/output fluxes of the SPM in the river mouth areas. The removal and the resuspension fluxes were comparable in the estuary. Meanwhile, old composition (whose deposition into the seabed for a long time is enough for ^{7}Be to decay completely) occupied only a small part in the resuspended sediment during resuspension process.

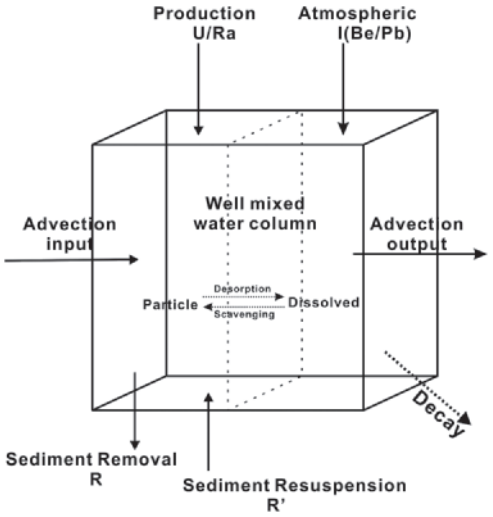


Fig. 6. Conceptual model of processes controlling the behavior and fate of ^{7}Be, ^{210}Pb, and ^{234}Th in the water column of the estuary (modified from *Mckee et al.* [1984] and *Feng et al.* [1999]).

交流与合作
Academic Exchange & Cooperation

实验室在“111”创新引智计划等项目的支持下，积极开展国际交流与合作，目前承担了“龙计划”3期、澳大利亚国家科学研究基金会中-澳国际合作项目“长江中下游淡水资源与气候变化”、欧盟第七框架等国际合作项目10项。
With the support from “111 Project” and other funding resources, SKLEC is active in international exchanges and cooperations. Currently, SKLEC is involved in a number of internationally cooperation projects, such as the ESA-MOST Dragon 3 programme, Australia Research Council “Freshwater Resources and Climate Change in the Middle and Lower Reaches of the Yangtze River”, and EU 7th Framework Project.

2013年实验室有70余人次参加国际学术会议，并有9人次做特邀报告或大会报告；近50人次赴国外合作研究或学术交流；接待国外学者来室合作研究与学术交流70多人次。主/承办3次国际会议、1次双边会议以及4次国内学术研讨会。2013年实验室共举办学术报告80场次。
In 2013, SKLEC members participated in international conferences for more than 70 person-times, including 9 invited talks and plenary lectures. There were nearly 50 person-time visiting abroad, and more than 70 person-time foreign experts visiting SKLEC. In 2013, SKLEC hosted three international conferences, one bilateral conference, as well as four national conferences. In total, nearly 80 lectures were given in SKLEC.

新增国际合作项目介绍
Brief Introduction of New International Cooperation Project

国家自然科学基金国际(地区)合作交流项目：自然与人类活动对俄罗斯远东和中国的河口生物地球化学过程的影响对比(41311120066)
NSFC Funds for International Cooperation and Exchange: Influence of Natural and Anthropogenic Factors on the Biogeochemical Processes in Estuaries of Russian Far East and China: Comparative Analysis (2013.01-2014.12)

本项目由国家自然科学基金委员会资助，中方承担单位为华东师范大学，外方为俄罗斯科学院远东分院的太平洋海洋研究所和太平洋地理研究所。本项目拟针对以下问题开展合作与学术交流：1) 进行河流常量化学成分的对比，认识在不同的气候带下风化作用对天然水中环境地球化学特点的控制作用；2) 通过对河口与近海生物地球化学循环与动力过程之间内在联系的分析，认识亚热带(即：中国)与高纬度(例如：俄罗斯的远东地区)生物地球化学过程对生源要素与痕量元素行为的制约，以及由此引起的对生态系统的作用。项目拟解决“气候变化与人类的活动怎样影响处于不同地理分带的流域盆地的化学物质的入海输送通量，以及陆源入海物质的变化如何通过不同近海的生物地球化学过程作用于边缘海的生态系统”的科学问题。
The project is funded by National Natural Science Foundation of China. It is jointly undertaken by SKLEC and V.I. Il'ichev Pacific Oceanological Institute and Pacific Geograhical Institute (PGI), Far East Branch of Russian Academy of Sciences. The project is focus on: 1) the comparative analysis on invariable chemical elements of the river, the recognition of the controlling role of the weathering progress on environmental geochemical characteristics of natural water body under different climate zones; 2) the analysis on internal relation between biogeochemical cycle and dynamical progress of estuaries and offshore areas, the recognition of the constraints of biogeochemical progress on biogenic elements and trace elements behavior of subtropical region (China) and high latitudes area (far eastern area of Russia) and the following ecosystem effect. The project is aim to solve the scientific problem of “How climate change and human activities affect the chemical flux of watershed basins in different geographic zones into the sea” and “How the change of terrestrial material into the sea effect on the offshore ecosystem by biogeochemical progress of different offshore areas”.

在研国际合作项目进展
Progress of International Cooperation Projects

国家自然科学基金国际(地区)合作与交流项目：长江河口和Ems河口细颗粒泥沙动力过程及其影响因素(51061130544)
NSFC International (Regional) Cooperation and Exchange Program: Fine Sediment Dynamic Process in the Yangtze River Estuary and Ems Estuary and Influencing Factors (2011.01-2014.12)

2013年，本项目进行了2次长江河口现场观测，在获潮流和含沙量数据同时，获得大量悬沙单颗粒和絮凝颗粒资料，为研究长江河口细颗粒泥沙特性和细颗粒泥沙行为动力学及泥沙再悬浮提供原始数据和新的认识。项目组李九发、程和琴和蒋陈娟于2013年8月31-9月14日访问荷兰Utrecht University，与H.E.de Swart教授团队交流，并赴Ems河口现场考察。中荷双方完成中外文学术论文10篇，其中5篇已发表。
Two field observations of tides and suspended sediments were carried out in 2013, which provided the first hand data for the study of fine sediment behaviors and sediment resuspension in the Yangtze River Estuary. Prof. Li Jiufa, Prof. Cheng Heqin and Dr. Jiang chengjuan from SKLEC visited Utrecht University during August 31 – September 14, 2013. During the visit, they discussed with Prof. H.E.de Swart's research team about the research progress, and went to the Ems Estuary for field work. Ten papers were produced, and five of them have been published.

科技部国际科技合作计划项目：波罗的海和东海的低氧的对比研究：以气候变化和土地利用改变为因素(2010DFA24590)
MOST International Cooperation Project: Comparison of Low Oxygen between the Baltic Sea and the East China Sea: Take Climate Change and Land Use as Factors (2011.01-2013.12)

2013年，开展了长江口低氧情况的重建研究。长江口E4柱样沉积物N同位素自底部向上逐渐下降，与长江过去几十年氮通量增加的趋势相吻合；近20年以来，甲藻的比重相对于硅藻来说在增加；基于沉积物中埋藏保存的光合色素，重建了1998年的长江洪水和1855年的黄河改道的历史事件。研究成果表明，在过去几百年以来，长江口外底层水即开始受到越来越大的氧亏损压力。
In 2013, we carried out reconstruction of Yangtze River Estuary's low oxygen history. The results show that N isotope from E4 core gradually decreased from 5‰ in bottom layer (in 1930) to 3.8‰ in the surface layer. It is consistent with the tendency that N flux from the Yangtze River is increasing in the past several decades. The proportion of dinoflagellate in relation to diatom increased in the past decades. Based on the photosynthetic pigment stored in the sediment deposit, the flooding event in 1998 of the Yangtze River, and shifting of the Yellow River in 1855, were also identified. The results show that the bottom water off the Yangtze River Estuary has experienced pressure of depleted oxygen pressure hundreds of years ago.

中国科技部与欧洲空间局合作项目—龙计划3期：河口沉积羽流及潮滩对人类活动和气候变化的响应(DRAGON 3 Id. 10555)
The ESA-MOST Dragon 3 Cooperation: Variations of Estuarine Turbid Plumes and Mudflats in Response to Human Activities and Climate Change(2012.06-2016.06)

"龙计划"三期项目是中国科技部与欧洲空间局，在地球观测科学与应用技术研究、培训、学术交流和数据共享等方面的交流合作。今年有两方面的工作：(1) 受邀在香港中文大学举行的欧空局-科技部合作的龙计划-3期"海洋遥感高级培训班"担任讲师，讲授中国海域大气校正算法以及观测、模型和环境预测等内容；(2) 与龙计划-3期合作方挪威的Nansen环境遥感研究中心的Anton Korosov博士开展学术交流与合作，内容包括海岸水域CDOM、盐度的遥感研究，水色要素光学模型的对比研究。
The ESA-MOST Dragon 3 cooperation is jointly supported by the Ministry of Science and Technology (MOST) of China and European Space Agency (ESA). In this year, Prof. Shen Fang was invited by EAS-MOST to give lectures in the course "Advanced Training Course in Ocean Remote Sensing", which was held in the Chinese University of Hong Kong on 21-26 October 2013. Dragon-3 European partner, Dr. Anton Korosov from Nansen Environmental and Remote Sensing Center (NERSC) visited SKLEC for two weeks. The cooperation work focus on: CDOM in estuarine and coastal water, remote sensing of salinity and comparative research of optical models of ocean color components.

国际科学基金委员会项目：长江口溶解有机氮研究：以氨基酸手性对应体为例(A/5112-1)
International Foundation for Science (IFS): A Study on Dissolved Organic Nitrogen in the Yangtze Estuary: Begin with Amino Acids Enantiomers (2012.02-2014.02)

2013年，围绕项目研究内容，收集了长江下游及长江口毗邻海域的颗粒态和溶解态样品。结合原有样品和资料，分析表明陆源惰性有机质含量高于近海表层，手性氨基酸含量表明在河口地区存在对陆源惰性有机质的稀释，但近海初级生产所贡献的大量新鲜、活性有机质也是近海可观惰性有机质产生的重要支撑。这其中的机理可能是新鲜有机质支撑了可观的异养过程，而陆源营养物质则成为自养微生物旺盛生长的重要支撑。通过微生物的细胞壁物质，近海有望成为惰性有机质的贡献场所。
In 2013, we collected the dissolved and particulate organic matter samples. Together with previous samples and data, we suggest that terrestrial non-labile organic matter is diluted in the estuary and coastal region by fresh produced organic matter in the coastal zone. However, the fresh organic matter derived from primary production is also the key materials that support remarkable non-labile organic matter generation. The possible mechanism is that the heterotrophic bacteria are promoted by primary production, and terrestrial nutrients stimulate in situ autotrophic bacteria growth. All these heterotrophic and autotrophic bacteria contribute non-labile organic matter through their cell wall compound: peptidoglycan. Therefore, the coastal region is another potential place that generates refractory organic matter.

澳大利亚国家科学研究基金会中-澳国际合作项目：长江中下游淡水资源与气候变化(20102700)
China – Australia CooperationProject of Australia Research Council: Freshwater Resources and Climate Change in the Middle and Lower Reaches of the Yangtze River (2011.1-2013.12)

来自墨尔本大学的四位专家在长江流域按项目计划开展了野外工作。2013年度研究结果表明长江硝酸盐含量升高主要受施肥的影响，从2000年起日益增多的家庭和工业污水也是主要因素之一。项目讨论了未来 40年(至2050年)的营养盐情景，为管理提供参考 (Xu et al., 2013，Global and Planetary Change, 106, 84-89)；开发了MUDDY LOICZ模型用于长江口水质的评估 (Xu et al., 2013, Estuarine, Coastal and Shelf science, 127，59-62)；考虑到气候变化和人类活动对长江的严重影响，我们对长江水系统面临的威胁进行了深入的分析(Finlayson et al., 2013, Regional Environmental Change，13，329–340)。
Scientists, including 3 professors and one associate professor from the University of Melbourne, came to China for the field work in the Yangtze catchment. After that, a symposium was held in SKLEC in July, 2013. The project results of 2013 has shown that the Yangtze freshwater is uploaded by DIN, primarily due to fertilizer, but, increasing domestic and industrial sewerage has become a major contributor since 2000. Scenario was done for the next 40 years until 2050, with a 10-year interval, showing implemental thresholds for administration (seeing Xu et al., 2013; Global and Planetary Change, 106, 84-89). To assess water quality in the Yangtze estuary, a MUDDY LOICZ model has been developed (seeing Xu et al., 2013, Estuarine, Coastal and Shelf science, 127, 59-62). This highlights the importance of future reduction of SSC in relation to nutrients in the estuarine waters due to Three-Gorges dam. Given the severe situation of the Yangtze due to climate change and human impact, we had a thorough review on threats to the water system (seeing Finlayson et al., 2013, Regional Environmental Change, 13, 329–340).

学术会议
Workshops & Conferences

第53届国际河口海岸学大会
ECSA 53: Estuaries and Coastal Areas in Times of Intense Change

2013年10月13-17日，“第53届国际河口海岸学大会”在上海召开。该会议由国际河口海岸科学协会(Estuarine and Coastal Science Association, ECSA)主办，华东师范大学与Elsevier出版社承办。来自美国、英国、意大利、法国、荷兰、澳大利亚、韩国、俄国、日本、德国、巴西等46个国家和地区的450余名代表围绕大会主题“快速变化下的河口海岸响应与管理”，就当今世界河口海岸面临的挑战及其可持续性发展进行了深入的探讨。大会的主要议题包括：河口海岸水域的服务功能；河口湿地的结构、功能与修复；来自陆地与海洋的生源要素的生物地球化学循环以及污染物质传输和累积；富营养化、低氧区与赤潮；气候变化的环境影响及其应对策略；河口海岸水域大型工程对地貌与生态过程的影响；河口生态系统健康与可持续性管理对策。国际河口海岸科学协会授予我国河口海岸科学研究领域的泰斗，河口海岸学国家重点实验室的奠基人、中国工程院院士陈吉余“终身成就奖”，这是该学会颁发的第二个终身成就奖。

ECSA 53, a major symposium of Estuarine and Coastal Science Association (ECSA), was held on 13-17, Oct., 2013. ECSA 53 was hosted by the State Key Laboratory of Estuarine and Coastal Research (SKLEC) at ECNU and Elsevier (Estuarine Coastal and Shelf Science). ECSA 53 attracts 450 scholars from home and abroad. Focusing on the theme of the symposium, “Estuaries and Coastal Areas in Times of Intense Change”, the scholars had conversations and discussions on the challenge and sustainable development of estuaries and coasts all over the world, including various topics of "Environmental Management of Enclosed Coastal Seas", "Effects of Human Activities and Global Change on Hydro-morphological Processes in Estuaries and Coastal Areas", “Quantifying Economic and Ecological Sustainability”, “Economic Development and Ecological and Socio-cultural Risks: the Socio-cultural-economic-ecology Interface”, “Technical Developments in Detecting Dhange and Managing Heavily Modified Estuaries”, as well as “Strategies and Tools for Improved Estuarine Management”. Prof. Chen Jiyu received the prestigious Lifetime Achievement Award at this conference. He was the second receiver of this award.

中国河口海岸和近海研究战略研讨会
Symposium on Research Frontiers of Estuary, Coast and Sea in China

2013年9月28-29日，973资环领域“中国河口海岸和近海研究战略研讨会”在上海举行，会议由科技部基础研究管理中心主办，河口海岸学国家重点实验室承办。包括科技部、国家自然科学基金委地学部、973资环领域的首席科学家在内的国内20多个知名涉海高校、科研院所的40多名专家、学者参加了此次会议。会议围绕我国河口海岸和近海的国家重大需求和关键科学问题，就我国海湾的生态环境问题、河口海岸带的生态环境问题、陆海相互作用及其生态环境效应、近海生态系统动力学、近海渔业资源的生态环境问题开展了深入的研讨。

This symposium was held on 28-29, Sep., 2013. It was organized by the Basic Research Management Center, the Ministry of Science and Technology (MOST). It attracted more than 40 experts from the MOST, National Natural Science Foundation (NSFC), universities and research institutes. The aims of the meeting were to identify the research frontiers in the following fields: 1) Ecological Problems of Gulf; 2) Ecological Problems of Estuarine and Coastal Zone; 3) The Land and Ocean Interactions and Its Ecological Effects; 4) Ecosystem Dynamics in The Coastal Ocean; 5) Fishery Resources of Coastal Ocean and Ecological Problems.

中巴河口海岸学术研讨会
Sino-Pakistan Joint Workshop on Estuarine and Coastal Studies

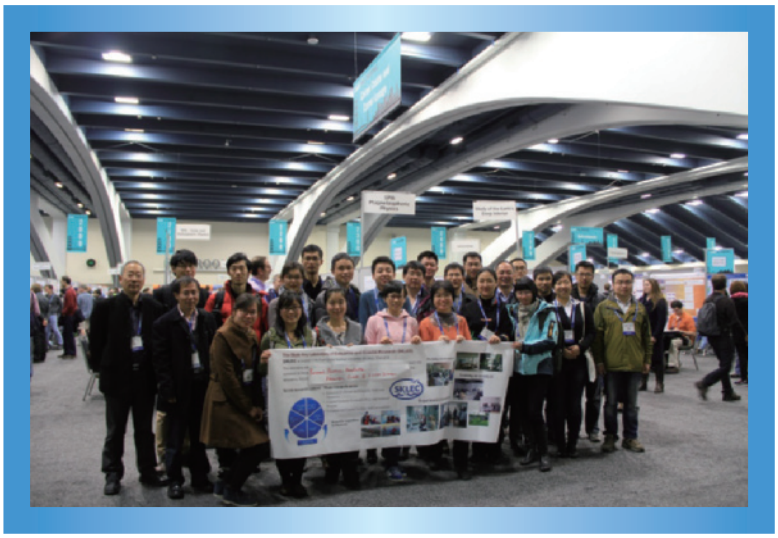
2013年6月25日至27日，中国-巴基斯坦“河口海岸学术研讨会”在我实验室召开，来自巴基斯坦国家海洋研究所、巴基斯坦科技部、国家海洋局第二海洋研究所，以及我实验室的科研人员共30余位参加了本次研讨会。双方学者就人类活动对河口海岸带的影响、泥沙输运与盐水入侵、河口生态系统营养盐与浮游植物动态、河口湿地与潮滩的未来、海岸带脆弱性评估等方面进行了交流。会议期间，除了学术报告，中巴双方科学家还就双方合作研究的内容、人员培训、互访等进行了充分讨论。

During 25-27, Jun., 2013, the Sino-Pakistan Joint workshop on Estuarine and Coastal Studies was held in Shanghai. More than 30 scientists from the National Institute of Oceanography (NIO), Pakistan, the Ministry of Science and Technology, Pakistan, the Second Institute of Oceanography (SIO), China, State Ocean Administration of China, and SKLEC of East China Normal University attended the workshop. The scientists shared new research results and various insights on the following topics: impacts of human activity on estuaries and coasts; sediment transportation and saltwater intrusion; the dynamics of nutrient and phytoplankton in the estuarine ecosystem, the fate and future of tidal flats in estuaries, and assessment proxies and models of coastal vulnerability. Potential collaborative research projects, professional training and academic exchange were also discussed during the workshop.

美国地球物理年会秋季会议Regime Changes in Estuarine and Coastal Systems专场
American Geophysical Union (AGU) Fall Meeting, session "Regime Changes in Estuarine and Coastal Systems"

2013年12月8日至13日，美国地球物理年会(AGU, American Geophysical Union)秋季会议在美国旧金山召开会，来自世界各地超过两万名科学家在AGU秋季年会上进行了学术交流。 "Regime Changes in Estuarine and Coastal Systems" 专题由我室承办，专题包括两个口头报告专场和一个展板报告专场。

The AGU Fall Meeting was held during 9-13, Dec., 2013, in San Francisco. More than 22,000 earth and space scientists, educators, students, and other related professionals attended the meeting. SKLEC chaired the session "Regime Changes in Estuarine and Coastal Systems", with 15 oral talks and 21 posters scheduled. The topics were focused on the recent advances in theories, observation and modelling techniques of estuarine and coastal studies.



河口近岸水环境中新型有机污染物研究学术研讨会
Workshop on Emerging Organic Pollution in Estuarine and Coastal Water Environment

2013年5月28日 "河口近岸水环境中新型有机污染物研究学术研讨会" 在上海召开。本次研讨会由华东师范大学河口海岸国家重点实验室发起主办。在为期两天的会议中，来自10余所高校和科研院所的40多位专家学者，就我国河口和近海海洋环境中各类新型有机污染的环境行为与持久性、复合污染机制和生态效应、生态风险评估及污染控制等问题展开了研讨。

The Workshop on Emerging Organic Pollution in Estuarine and Coastal Water Environment was held in Shanghai on 28, May, 2013. This workshop was proposed and organized by the resarchers in SKLEC. About 40 researchers from more than 10 universities and institutes discussed the emerging organic pollution in estuaries and coasts in China. The topics included the environmental behavior and persistence, the mechanisms of combined pollution and their ecological effects, and the ecological risk assessment and pollution control of various emerging organic pollutants.

河口海岸湿地生态服务功能与增汇减排学术沙龙
Workshop on Ecological Services of Estuarine and Coastal Wetlands and Its Role in Carbon Management

2013年8月31日至9月1日，“河口海岸湿地生态服务功能与增汇减排学术沙龙”在我室召开。来自国内的二十余位学者专家针对我国典型滨海湿地类型(盐沼、红树林、珊瑚礁、海草床)，重点讨论滨海湿地碳增汇减排、水质净化、生物多样性、护岸减灾以及湿地与渔业资源等的关系，探讨人类活动和气候变化的影响，为国家增汇减排战略提出相应的措施建议。

The workshop was held during 31, Aug. to 1, Sep., 2013. More than 20 experts discussed about ecological services of coastal wetlands (salt marshes, mangroves, coral reefs, and seagrass), which includes carbon storage, water purification, biodiversity conservation, coastal protection, and the relationship between wetlands and fishery resources. The influence of human activities and climate change on wetlands was explored, and strategies for carbon management were discussed.

中国海洋学会2013学术年会“自然过程和人类活动影响下的河口海岸学术研讨会”专题
The 2013 Annual Meeting of Chinese Society for Oceanography "Influence of Natural Process and Human Activities on Estuaries and Coasts"

2013年9月2日-3日，中国海洋学会2013年学术年会在上海召开，第四分会场“自然过程和人类活动影响下的河口海岸学术研讨会”由我室协办，来自华东师范大学、厦门大学、中国海洋大学、南京大学、浙江大学、国家海洋局第一海洋研究所、国家海洋局第二海洋研究所、国家海洋技术中心、国家海洋局东海环境监测中心、中国科学院地质与地球物理研究所、中国水产科学研究院东海水产研究所等26家高校和科研院所的70余位专家学者和研究生参加了本次会议。

The 2013 annual meeting of Chinese Society for Oceanography (CSO) was held on 2-3, Sep., 2013 in Shanghai. The session “Influence of Natural Process and Human Activities on Estuaries and Coasts” was hosted by SKLEC. It attracted more than 70 experts and scholars from 26 universities and institutes, including East China Normal University, Xiamen University, Ocean University of China, Nanjing University, Zhejiang University, the First Institute of Oceanography of SOA, the Second Institute of Oceanography of SOA, National Ocean Technology Center, East China Sea Environment Monitoring Center of SOA, Institute of Geology and Geophysics of Chinese Academy of Sciences, East China Sea Fisheries Research Institute Chinese Academy of Fishery Sciences.

专家学者来访
Visiting Scholars

2013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。
In 2013, more than 70 scholars visited SKLEC.

List of Visitors

专家 Visiting Scholar	单位 Affiliation	备注 Remark
Ian Thomas	澳大利亚墨尔本大学 The University of Melbourne, Australia	“111计划” 骨干 Member of “111 project”
Michael Webber	澳大利亚墨尔本大学 The University of Melbourne, Australia	“111计划” 骨干 Member of “111 project”
Brian Finlayson	澳大利亚墨尔本大学 The University of Melbourne, Australia	“111计划” 骨干 Member of “111 project”
Venu. Ittekkot	德国不莱梅热带海洋生态中心 Center for Marine Tropical Ecology, German	“111计划” 骨干 Member of “111 project”
Zhengbing Wang	荷兰代尔夫特理工大学 Delft University of Technology, the Netherlands	“111计划” 骨干 Member of “111 project” 长江学者讲座教授 Visiting Changjiang Scholar
Bas van Maren	荷兰代尔夫特理工大学 Delft University of Technology, the Netherlands	“111计划” 骨干 Member of “111 project”
Huib de Vriend	荷兰代尔夫特理工大学 Delft University of Technology, the Netherlands	“111计划” 骨干 Member of “111 project”
J.C. Winterwerp	荷兰代尔夫特理工大学 Delft University of Technology, the Netherlands	“111计划” 骨干 Member of “111 project”
Miguel De Lucas Pardo	荷兰代尔夫特理工大学 Delft University of Technology, the Netherlands	“111计划” 骨干 Member of “111 project”
Z. (Bob) Su	荷兰屯特大学 Twente University, the Netherlands	“111计划” 骨干 Member of “111 project”
Keqi Zhang	美国佛罗里达国际大学 Florida International University, USA	“111计划” 骨干 Member of “111 project” 上海千人短期 Shanghai Thousand Talents
Willard S Moore	美国南卡罗来纳州大学 South Carolina State University, USA	“111计划” 骨干 Member of “111 project”
Zhaoqing Yang	美国西北太平洋国家实验室(PNNL) Pacific Northwest National Laboratory(PNNL), USA	“111计划” 骨干 Member of “111 project”
Christopher Craft	美国印第安纳州立大学 Indianan State University, USA	“111计划” 骨干 Member of “111 project” Wetlands 副主编 Deputy editor of ***Wetlands***

专家 Visiting Scholar	单位 Affiliation	备注 Remark
Mark Ellaway	墨尔本大学 The University of Melbourne, Australia	“111计划”骨干 Member of “111 project”
Victor N. de Jonge	英国赫尔大学 University of Hull, UK	“111计划”骨干 Member of “111 project” Ocean & Coastal Management主编 Editor in chief of ***Ocean & Coastal Management***
Rainer Grun	澳大利亚国立大学 Australian National University, Australia	
Barbara Robson	澳大利亚联邦科学与工业研究组织 CSIRO - CSIRO Land and Water, Australia	
Kenneth Lee	澳大利亚联邦科学与工业研究组织 CSIRO , Australia	
Andrew Steven	澳大利亚联邦科学与工业研究组织 CSIRO , Australia	
Phillipa Ormandy	澳大利亚联邦科学与工业研究组织 CSIRO , Australia	
Ian Cresswell	澳大利亚联邦科学与工业研究组织 CSIRO, Australia	
Jone Keesing	澳大利亚联邦科学与工业研究组织 CSIRO, Australia	
Mark Baird	澳大利亚联邦科学与工业研究组织 CSIRO, Australia	
Rosalind Bark	澳大利亚联邦科学与工业研究组织 CSIRO, Australia	
Simon Allen	澳大利亚联邦科学与工业研究组织 CSIRO, Australia	
Andy Fischer	澳大利亚塔斯马尼亚大学 University of Tasmania, Australia	
Wang Xiaohua	澳大利亚新南威尔斯大学 The University of New South Wales, Australia	
Ali R Tabrez	巴基斯坦国家海洋研究所 National Institute of Oceanography, Pakistan	中巴合作 Joint Research
Aneela Shaheen	巴基斯坦国家海洋研究所 National Institute of Oceanography, Pakistan	中巴合作 Joint Research
Hina Saeed Baig	巴基斯坦国家海洋研究所 National Institute of Oceanography, Pakistan	中巴合作 Joint Research
Monawwar Saleem	巴基斯坦国家海洋研究所 National Institute of Oceanography, Pakistan	中巴合作 Joint Research
Noor Ahmed Kalhoro	巴基斯坦国家海洋研究所 National Institute of Oceanography, Pakistan	中巴合作 Joint Research

专家 Visiting Scholar	单位 Affiliation	备注 Remark
Samina Kidwai	巴基斯坦国家海洋研究所 National Institute of Oceanography, Pakistan	中巴合作 Joint Research
Sanober Kahkashan	巴基斯坦国家海洋研究所 National Institute of Oceanography, Pakistan	中巴合作 Joint Research
Syed Abid Ali	巴基斯坦国家海洋研究所 National Institute of Oceanography, Pakistan	中巴合作 Joint Research
Hou Xiaolin	丹麦科技大学 Technical University of Denmark, Denmark	
Robert Hetland	德克萨斯AM大学 Texas A&M University, USA	
Zhaoru Zhang	德克萨斯AM大学 Texas A&M University, USA	
Tatyana Mikhaylik	俄国海参威太平洋海洋研究所 Pacific Oceanological Institute, Russa	中巴合作 Joint Research
Pavel Semkin	俄国海参威太平洋海洋研究所 Pacific Oceanological Institute, Russia	中俄合作项目 Joint Research
Pavel Tishchenko	俄国海参威太平洋海洋研究所 Pacific Oceanological Institute, Russia	中俄合作项目 Joint Research
Steffen Happel	法国Triskem International公司 TrisKem International SAS, France	
Adam Fenech	美国爱德华王子岛大学 University of Prince Edward Island, USA	
Changming Dong	美国加州大学洛杉矶分校 University of California, Los Angeles, USA	
Changsheng Chen	美国麻省大学 The University of Massachusetts, USA	华东师范大学紫江学者讲座教授 Zi Jiang Scholar
Eileen Hofmann	美国欧明道大学 Old Dominion University, USA	
Bamy Whitman	美国乔治亚大学 The University of Georgia, USA	
Jian Shen	美国威廉玛丽大学 College of William and Mary, USA	上海千人短期 Shanghai Thousand Talents
Marcia Silva	美国威斯康辛大学米尔沃基分校 University of Wisconsin-Milwaukee, USA	
Rocky Geyer	美国伍兹霍尔海洋研究所 Woods Hole Oceanographic Institution, USA	
Weifeng Gordon Zhang	美国伍兹霍尔海洋研究所 Woods Hole Oceanographic Institution,USA	
Julius Ibukun Agboola	尼日利亚拉各斯州大学 Lagos State University, Nigeria	

专家 Visiting Scholar	单位 Affiliation	备注 Remark
Anton Korosov	挪威卑尔根大学 University of Bergen, Norway	
Johnny Johannessen	挪威卑尔根大学 University of Bergen, Norway	
Evgeniy Yakushev	挪威水环境研究中心 Norwegian Institute for Water Research, Norway	
Richard Bellerby	挪威水环境研究中心 Norwegian Institute for Water Research, Norway	外专千人 Recruitment Program of Foreign Experts
Nathalie Morata	挪威特罗姆瑟大学 University of Tromsø, Norway	
Alice Newton	葡萄牙阿尔加维大学大学 Universidade do Algarve, Portugal	LOICZ科学指导委员会前主席 Former Chairman of LOICZ Scientific Steering Committee
Xinyu Guo	日本爱媛大学 Ehime University, Japan	开放课题 SKLEC Open Fund Recipient
Gisela Helene Fontaine	瑞士UFAG实验室 UFAG Laboratorienag, Switzerland	
Daniel Tabersky	苏黎世联邦理工学院 Laboratory of Inorganic Chemistry, ETH Zurich	
Jiayi Pan	香港中文大学 Chinese University of Hong Kong, China	
P. Vethamony	印度国家海洋研究所 National Institute of Oceanography, Indian	
Andy Smerdon	英国Aquatec公司 Aquatec Inc, UK	
Christopher Pain	英国帝国理工 Imperial College London,UK	
David Ryves	英国拉夫堡大学 Loughborough University, UK	
Weidong Xu	英国普利茅斯海洋研究所 Plymouth Marine Laboratory, UK	
Exequiel R. Gonzalel	智利圣托马斯大学圣地亚哥分校 University of St. Thomas, Chile	校长 President
Hernan Swart Figueroa	智利圣托马斯大学圣地亚哥分校 University of St. Thomas, Chile	副校长 Vice-President

邀请报告
Invited Presentations at International Conferences

2013年实验室有70余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。
Members of SKLEC attended international conferences for more than 70 person-times, including 8 invited talks and plenary lectures.

Chen Zhongyuan, Post-dam Assessment for Change in Riverbed and Delta-coast Response after Impoundment of 3-Gorges Damming - ***The 8th IAG International Conference on Geomorphology,*** Aug. 27-31, Pairs, France.

Chen Zhongyuan, Assessing nitrogen flux in the Yangtze River, China: sources and scenarios- ***The Tenth International Conference on Environmental Management of Enclosed,*** Oct. 28-Nov. 4, Marmaris, Turkey.

Ding Pingxing, Environmental evolution of Chinese largest river estuaries in the past half century and its response to global change- ***ECSA53: Estuaries and coastal areas in times of intense change,*** Oct.13-17, Shanghai, China.

Du Jinzhou, Analysis of radionuclides in marine environments and their implications- ***The 2nd Nordic Workshop on Radioanalytical Analysis,*** Sep. 2-6, Roskilde,Denmark.

Zhang Weiguo, Sedimentary Record in the Yangtze River Estuary and its Response to Environmental Change in the Catchment - ***RIHN-China International Symposium "Welfare and Environment in East Asia",*** Jul. 15-18, Kyoto, Japan.

Zhang Weiguo, Magnetic Properties of Sediments from the Yangtze Delta and Environmental Implications- ***12th Scientific Assembly of the International Association of Geomagnetism and Aeronomy (IAGA),*** Aug. 26-31, Merida, Mexico.

Zhang Weiguo, The Yangtze estuary in the Anthropocene: Past , Present and future - ***ECSA53: Estuaries and coastal areas in times of intense change,*** Oct. 13-17, Shanghai, China.

Zhou Junliang, Impacts of Glyphosate on the Germination, Growth and Photosynthesis of Lettuce and Tomato- ***The 2nd Changbai Mountain International Forum,*** Aug. 22-25, Yanji, China.

开放基金
SKLEC Research Fund

2013年，实验室在研开放基金22项，共92万元，新增开放基金13项，共51万元。
There were 22 on-going projects funded by SKLEC with a total of 0.92 million RMB in 2013, and 13 new projects amounted to 0.51 million RMB.

2013年河口海岸学国家重点实验室开放基金获得者
Recipients of SKLEC Research Fund in 2013

姓名 Name	课题名称 Title	单位 Affiliation
邢小罡 Xiaogang Xing	利用Bio-Argo浮标观测中国近海生物光学特性的昼夜与季节变化 Observation on Diurnal and Seasonal Variation of Optical and Biological Properties of Offshore China with Bio-Argo Buoy	中国海洋大学 Ocean University of China
周雯 Wen Zhou	浮游植物散射特性的变化特征及其影响因素分析 Variation Features of Phytoplankton Scattering Properties and Its Influencing Factor	中国科学院南海海洋研究所 South China Sea Institute of Oceanology, Chinese Academy of Sciences
李欢 Huan Li	浅水地形的遥感探测技术研究 Remote Sensing Detection for Shallow Water Topography	河海大学 Hohai University
Huan Feng	Sediment Metal Contamination and Bioremediation Study in Yangtze River Intertidal Zone for Coastal Sustainable Development	Montclair State University
彭俊 Jun Peng	废黄河三角洲侵蚀性潮滩沉积变异性及其沉积动力环境指示 Sediment Variability of Erosive Tidal Flat in the Abandoned Huanghe River Delta and Its Implications for Sedimentation Dynamics	盐城师范学院 Yancheng Teachers University
姚庆祯 Qingzhen Yao	运用多核素示踪技术研究长江口沉积物再悬浮的深度和时间尺度 Tracing the Depth and Time Scale of Sediment Re-suspension in the Yangtze Estuary using Multi-radionuclide Tracer Techniques	中国海洋大学 Ocean University of China
黄晖 Hui Huang	琼东近岸珊瑚礁生态系统对2010年洪水的响应研究 Response of Coral Reef Ecological System in Qiongdong Coast to the Flood in 2010	中国科学院南海海洋研究所 South China Sea Institute of Oeanology, Chinese Academy of Sciences
Pavel Ya.Tishchenko	Comparative study of biogeochemistry of two estuaries: Amur River and Changjiang	Pacific Oceanological Institute, Far Eastern Branch of Russian Academy of Sciences
孙永光 Yongguang Sun	红树林种间格局参数在群落健康评价中的有效性及尺度效应 Effectiveness of Spatial Distribution Pattern Parameters of Mangrove Species in Community Healthy Status Evaluation and Its Scale Effect	国家海洋局国家海洋环境监测中心 Environmental Monitoring Center, State Oceanic Administration
叶琳琳 Linlin Ye	崇明岛河网溶解性有机氮生物可利用性及其对蓝藻优势确立的影响研究 Bioavailability of Dissolved Organic Nitrogen of River Network in Chongming Island and Its Impact on the Dominance of Cyanbacteria specie	南通大学 Nantong University
何德富 Defu He	长江河口主要氨基甲酸酯类农药检测及其生态毒性初步研究 Detection of Major Carbamate Pesticides in the Yangtze River Estuary and Its Eco-toxicity	华东师范大学 East China Normal University
李路 Lu Li	长江口北港北汊演变对盐水入侵的影响 Evolution of North Branch of Northern Waterway in the Yangtze River Estuary and Its Impact of on Saltwater Intrusion	复旦大学 Fudan University
英小明 Xiaoming Ying	中山翠亨人工岛冲淤机制研究 Erosion and Deposition Mechanism of Cuiheng Artificial Island in Zhongshan	国家海洋局南海海洋工程勘察与环境研究院 Oceaneering and Environment Institute, South China Sea Branch, State Oceanic Administration

论文专著
List of Peer Reviewed Publications

2013年，实验室在国内外重要刊物上共发表学术论文160多篇，其中国外刊物79篇，国内重要刊物69篇，在国际会议论文集或专集上发表论文2篇，在国际期刊主编专辑4期，出版专著4册、中文教材1册。
In 2013, more than 160 peer-reviewed papers and books were published, among which 79 were published in international journals, 69 in national journals, 2 in international conference proceedings. Members of SKLEC edit 4 special issues in international journals and published 5 books.

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

[1] Balzer, W.*, Boehler, E., Tang, X.L., Ren, J.L., Zhang, J., Arsenic in solution, colloidal and particulate phases of East-Hainan estuaries. ***Continental Shelf Research,*** 2013, 57(Special Issue: SI): 73-81.

[2] Bao, H.Y.*, Wu, Y., Unger, D., Du, J.Z., Herbeck, L.S. Zhang, J., Impact of the conversion of mangroves into aquaculture ponds on the sedimentary organic matter composition in a tidal flat estuary (Hainan Island, China). ***Continental Shelf Research,*** 2013, 57(Special Issue: SI): 82-91.

[3] Boss, E.*, Gildor, H., Slade, W., Sokoletsky, L, Oren, A., Loftin, J., Optical properties of the Dead Sea. ***Journal of Geophysical Research-Oceans,*** 2013, 118(4): 1821-1829.

[4] Cai,Y., Jiang,J.S.*, Liu, Z.W., Zeng, Y., Zhang, W.G., Magnetically-sensitive shape memory polyurethane composites crosslinked with multi-walled carbon nanotubes. ***Composites Part A-Applied Science and Manufacturing,*** 2013, 53: 16-23.

[5] Chen, G.Q., Yi, L.*, Xu, X.Y., Yu, H.J., Cao, J.R., Su, Q., Yang, L.H., Xu, Y.H., Ge, J.Y., Lai, Z.P., Testing the standardized growth curve (SGC) to OSL dating coastal sediments from the south Bohai Sea, China. ***Geochronometria,*** 2013, 40(2): 101-112.

[6] Cheng, J.P., Gu, Y.J, Cheng, S.H.*, Wong, W.T., Surface functionalized gold nanoparticles for drug delivery. ***Journal of Biomedical Nanotechnology,*** 2013, 9 (8): 1362-1369.

[7] Dai, Z.J.*, Chu, A., Li, W.H., Li, J.F., Wu, H.L., Has suspended sediment concentration near the mouth bar of the Yangtze (Changjiang) Estuary been declining in recent years? ***Journal of Coastal Research,*** 2013, 29(4): 809-818.

[8] Dai, Z.J.*, Liu, J.T.*, Fu, G., Xie, H.L., A thirteen-year record of bathymetric changes in the North Passage, Changjiang (Yangtze) estuary. ***Geomorphology,*** 2013, 187: 101-107.

[9] Dai, Z.J.*, Liu, J.T.*, Impacts of large dams on downstream fluvial sedimentation: An example of the Three Gorges Dam (TGD) on the Changjiang (Yangtze River). ***Journal of Hydrology,*** 2013, 480: 10-18.

[10] Du, J.Z.*, Moore, W.S., Hsh, H.F., Wang, G.Z., Scholten, J., Henderson, P., Men, W.,Rengarajan, R., Sha, Z.J, Jiao, J.J., Inter-comparison of radium analysis in coastal sea water of the Asian region. ***Marine Chemistry,*** 2013, 156 (SI): 138-145.

[11] Feng, H.*, Qian, Y., Gallagher, F.J., Wu, M.Y., Zhang, W.G., Yu, L.Z., Zhu, Q.Z., Zhang, K.W., Liu, C.J., Tappero, R., Lead accumulation and association with Fe on Typha latifolia root from an urban brownfield site. ***Environmental Science and Pollution Research,*** 2013, 20(6): 3743-3750.

[12] Finlayson, B.L.*, Barnett, J., Wei, T.Y., Webber, M., Li, M.T., Wang, M.Y., Chen, J., Xu, H., Chen, Z.Y., The drivers of risk to water security in Shanghai. ***Regional Environmental Change,*** 2013, 13(2): 329-340.

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[14] Fu, J., Tang, X.L., Zhang, J., Balzer, W.*, Estuarine modification of dissolved and particulate trace metals in major rivers of East-Hainan, China. ***Continental Shelf Research,*** 2013, 57(Special Issue: SI): 59-72.

[15] Fu, X.Y., Svoboda, M., Tang, Z.H.*, Dai, Z.J., Wu, J.J., An overview of US state drought plans: crisis or risk management? ***Natural Harards,*** 2013, 69: 1607-1627.

[16] Ge, J.Z.*, Ding, P.X., Chen, C.S., Hu S., Fu, G., Wu, L.Y., An integrated East China Sea-Changjiang Estuary model system with aim at resolving multi-scale regional-shelf-estuarine dynamics. ***Ocean Dynamics,*** 2013, 63(8): 881-900.

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[19] Ge, Z.M., Cao, H.B., Zhang, L.Q.*, A process-based grid model for the simulation of range expansion of Spartina alterniflora on the coastal saltmarshes in the Yangtze Estuary. ***Ecological Engineering,*** 2013, 58: 105-112.

[20] Giosan, L.*, Constantinescu, S., Filip, F., Deng, B., Maintenance of large deltas through channelization: Nature vs. humans in the Danube delta. ***Anthropocene,*** 2013, 1: 35-45.

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[37] Liu, W.L.*, Liu, R.Y., Two New Species of Acutigebia (Crustacea: Decapoda: Gebiidea: Upogebiidae) from the South China Sea. ***Raffles Bulletin of Zoology,*** 2013, 61(2): 571-577.

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[39] Mo, H.L., Jiang, D.M., Wang, C.M., Zhang, W.G., Jiang, J.S.*, Magnetic, dielectric and magnetoelectric properties of $CoFe_2O_4$-$Bi_{0.85}La_{0.15}FeO_3$ multiferroic composites. ***Journal of Alloys and Compounds,*** 2013, 579: 187-191.

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[42] Roder, C.*, Wu, Z.J., Richter, C., Zhang, J., Coral reef degradation and metabolic performance of the scleractinian coral Porites lutea under anthropogenic impact along the NE coast of Hainan Island, South China Sea. ***Continental Shelf Research,*** 2013, 57(Special Issue: SI): 123-131.

[43] Shen, F.*, Zhou, Y.X., Li, J.F., He, Q., Verhoef, W., Remotely sensed variability of the suspended sediment concentration and its response to decreased river discharge in the Yangtze estuary and adjacent coast. ***Continental Shelf Research,*** 2013, 69, 52-61.

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[45] Sokoletsky, L.G.*, Kokhanovsky, A.A., Shen, F., Comparative analysis of radiative transfer approaches for calculation of diffuse reflectance of plane-parallel light scattering layers. ***Applied Optics,*** 2013, 52(35): 8471-8483.

[46] Song, B., Li, Z.*, Saito, Y., Okuno, J., Li, Z., Lu, A.Q., Hua, D., Li, J., Li, Y.X., Nakashima, R., Initiation of the Changjiang (Yangtze) delta and its response to the mid-Holocene sea level change. ***Palaeogeography, Palaeoclimatology, Palaeoecology,*** 2013. 388: 81-97.

[47] Su, N., Du, J.Z.*, Li, Y., Zhang, J., Evaluation of surface water mixing and associated nutrient fluxes in the East China Sea using ^{226}Ra and ^{228}Ra. ***Marine Chemistry,*** 2013, 156 (SI): 108-119.

[48] Su, N., Du, J.Z.*, Liu, S.M., Zhang, J., Nutrient fluxes via radium isotopes from the coast to offshore and from the seafloor to upper waters after the 2009 spring bloom in the Yellow Sea. ***Deep-Sea Research II,*** 2013, 97: 33-42.

[49] Tang, Z.H.*, Dai, Z.J., Fu, X.Y., Li, X., Content analysis for the U.S. coastal states' climate action plans in managing the risks of extreme climate events and disasters. ***Ocean & Coastal Management,*** 2013, 80: 46-54.

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国内刊物发表论文列表
List of Chinese Peer Reviewed Publications

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专辑
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国际河口海岸科学协会授予我室陈吉余院士“终身成就奖”，这是该学会颁发的第二个终身成就奖。
Prof. Chen Jiyu received the prestigious Lifetime Achievement Award from the Estuarine Coastal Sciences Association (ECSA). He was the second recipient of this award.

由我院(室)陈吉余院士领衔完成的“长江特枯水情影响上海淡水资源安全的关键评估技术及其应用”成果荣获上海市科学技术奖三等奖。
The research team headed by Academician Chen Jiyu, received the Shanghai Natural Science Awards (Grade III) (20124163-3-D01) from the Shanghai Municipal Government. The awarded research work was entitled “Critical assessment technology for freshwater resource safety in Shanghai under extreme drought condition of the Yangtze River and its application”.

由我(院)沈焕庭教授、李九发教授合著的《长江河口水沙输运》获得由国家海洋局、中国海洋学会、中国太平洋学会、中国海洋湖沼学会联合颁发的2013年度优秀海洋科技图书奖。
The book “Water and Sediment Transport in the Yangtze River Estuary”, co-authored by Profs. Shen Huanting and Li jiufa, has been selected as Excellent Ocean Science and Technology Book in 2013 by the State Oceanic Administration of China (SOA), Chinese Society for Oceanography (CSO), Pacific Society of China (PSC) and Chinese Society for Oceanology and Limnology (CSOL).

我院(室)作为“长江口南北港分汊河段航道整治关键技术研究”项目的第五完成单位，荣获中国水运建设行业协会科学技术奖一等奖，何青教授、虞志英教授获个人一等奖。
As the fifth institution that finished the project “Critical technology of South and North Channel Bifurcation Regulation in the Yangtze Estuary”, SKLEC received the Scientific and Technical Award (Grade I) issued by China Water Transportation and Construction Association. Profs. He Qing and Yu Zhiying received individual Prize (Grade I).

我室李秀珍教授、戴志军教授分别获得中国自然资源学会颁发的“中国自然资源学会优秀科技奖”和“中国自然资源学会青年科技奖”荣誉称号。
Prof. Li Xiuzhen and Prof. Dai Zhijun received Excellent Science and Technology Award and Young Science and Technology Award from China Society of Natural Resources (CSNR), respectively.

软件著作权
Software Copyrights

2013年，实验室获得软件著作权2项。
In 2013, SKLEC was authorized with 2 software copyrights.

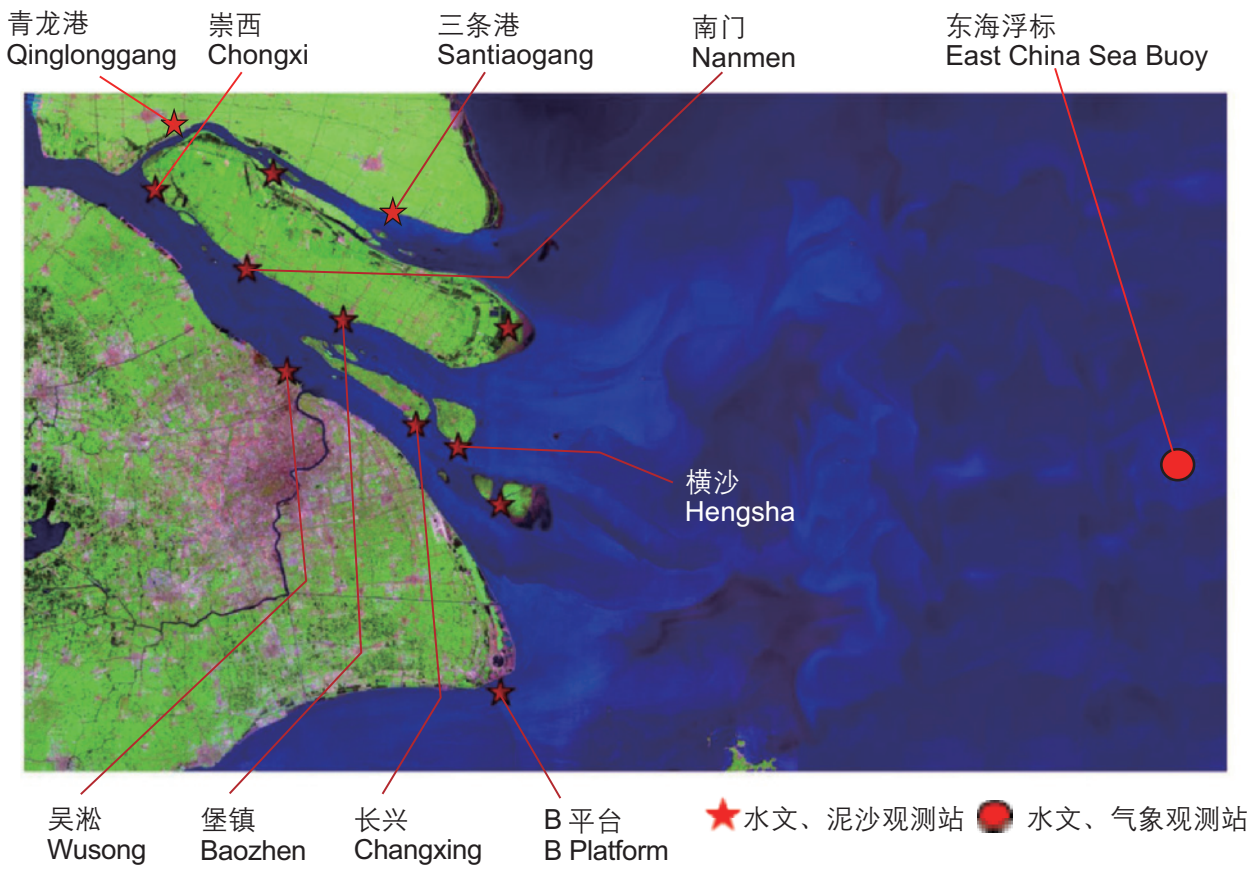
软件名称	完成人	登记号	著作权人	登记日期
三维河口海岸泥沙数值模拟软件[简称：河口海岸泥沙数值模拟软件]V1.0	朱建荣，吴辉，李路，曹慧江，徐元	2013SR053652	中交上海航道勘察设计研究院有限公司，华东师范大学	2013.06.03
三维河口海岸潮流水动力数值模拟软件[简称：河口海岸潮流水动力数值模拟软件]V1.0	朱建荣，吴辉，李路，曹慧江，徐元	2013SR054192	华东师范大学，中交上海航道勘察设计研究院有限公司	2013.06.03

颁证单位：中华人民共和国国家版权局

平台与仪器
Facilities & Equipments

2013年，实验室利用学校“985工程二期”平台建设经费、“211重点学科三期”建设经费和科技部实验室专项经费中的仪器设备费，增设三条港、青龙港、大通3个水文、泥沙等多参数野外长期监测站，购置了多台大型室内、野外仪器。实验室大部分大型仪器设备均加入了上海市研发公共服务平台，对社会开放和共享。

In 2013, with support of the "985” and “211” Project from ECNU, and special funding from the Ministry of Science and Technology (MOST) of China, three hydrological observation stations, namely Santiaogang, Qinglonggang and Datong were established. A number of field survey instruments and laboratory analysis facilities were installed. Most of the equipments participated in the Shanghai R&D Public Service Platform for public access.



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

新增仪器
New Equipments

新增室内大型仪器设备(20万元以上)
New Instruments for Laboratory Analysis

设备名称 Equipment	生产厂商 / 型号 Manufacturer / Type
等离子体发射光谱仪/ Inductively Coupled Plasma Optical Emission Spectrometer	Thermo Fisher Scientific Inc., China / 7400
微波消解仪/ Microwave Digestion System	Anton Paar GmbH, Austria / Multiwave PRO
总有机碳分析仪/ TOC Analyzer	Shimadzu Corporation, Japan / TOC-L CPH
超低本底五路 β 计数器/ Low-level Beta Multicounter System	Technical University of Denmark Center for Nuclear Technologies / model Risø GM-25-5
正置荧光显微镜/ Automated Upright Fluorescence Microscope	Leica Microsystems CMS GmbH,Germany / Leica DM 4000

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
声学多普勒海流剖面仪/ ADCP-Acoustic Doppler Current Profiler	Teledyne RD Instruments Company, USA/ADCP WHRG-600K
温盐深仪/CTD Sensor	Seabird Instruments Company, USA/ CTD SBE19

人才培养
Student Programs

2013年实验室在读的研究生224人，其中博士研究生109人，硕士研究生115人。
There are 224 postgraduate students in SKLEC, including 109 Ph.D. students, and 115 M.Sc. students.

学位授予
Degrees Offered

硕士学位：自然地理学；地图学与地理信息系统；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; Cartography and Geographic Information Systems; 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

2013年实验室共招收硕士研究生39人，其中留学生1人，博士研究生21人，其中直博生10人、硕博连读2人、留学生2人。2013年共毕业33人，其中博士生7人，硕士生26人，鲍红艳、季韬、张朝阳、温廷宇获得2013年上海市优秀毕业生称号。
Sixty (60) students were enrolled in 2013, including 21 Ph.D. and 39 M.Sc. students. Thirty-three (33) students graduated in 2013, including 7 Ph.D. and 26 M.Sc. students. Bao Hongyan, Ji Tao, Zhang Chaoyang and Wen Tingyu were honored as Outstanding Graduate Students 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
罗向欣 Luo Xiangxin	杨世伦 Yang Shilun	长江中下游、河口及邻近海域底床沉积物粒径的时空变化：自然机制和人类活动的影响/The spatial and temporal variation in sediment grain size in middle and lower Yangtze River, Yangtze Estuary and the offshore area adjacent to Yangtze Estuary: the impact of natural factors and human activities	中山大学 Sun Yat-sen University
吴创收 Wu Chuangshou	杨世伦 Yang Shilun	华南流域人类活动和气候变化对入海水沙通量和三角洲演化的影响—以珠江、南渡江和万泉河为例/Impacts of human activities and climate change on sediment flux and delta evolution in Southern China basin: to the Pearl River, Nandujiang River and Wanquanhe River as an example	浙江省水利河口研究院 Zhejiang Institute of Hydraulics and Estuary

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
张耀玲 Zhang Yaoling	杜金洲 Du Jinzhou	近海环境中天然有机质的分离与表征/ Isolation and characterization of natural organic matter in coastal environments	中国科学院青海盐湖研究所/ Qinghai Institute of Salt Lakes, CAS
苏妮 Su Ni	杜金洲 Du Jinzhou	镭同位素示踪的近岸水体混合和海底地下水排泄/ Tracing coastal water mixing processes and submarine groundwater discharge by radium isotopes	
鲍红艳 Bao Hongyan	吴莹 Wu Ying	溶解态和颗粒态陆源有机质在典型河流和河口的来源、迁移和转化/The sources, transportations and transformations of dissolved and particulate terrestrial organic matter in typical river and estuary systems	厦门大学(博士后) Postdoctoral Fellow, Xiamen University
陈广泉 Chen Guangquan	陈沈良 Chen Shenliang	莱州湾地区海水入侵的影响机制及预警预评价研究/Mechanisms underlying of seawater intrusion and evaluation of early warning systems in the Laizhou Bay area	国家海洋局第一海洋研究所/First Institute of Oceanography, State Oceanic Administration of China

生态学/Ecology

姓名 Name	导师 Surpervisor	毕业论文题目 Thesis	就业单位 Employment
辛在军 Xin Zaijun	李秀珍 Li Xiuzhen	水芹生态浮床净化功能影响因素与生态化学计量研究 /Influencing Factors for the Purification Function of Water Cress Floating-beds and Stoichiometry	江西省科学院图书馆 Jiangxi Academy of Sciences Library

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
刘猛/Liu Meng	沈芳/Shen Fang	王一斌/Wang Yibin	李九发/Li Jiufa
袁代亮/Yuan Dailiang	何青/He Qing	周莹/Zhou Yin	程和琴/Cheng Heqin
杨艳/Yang Yan	王张华/Wang Zhanghua		

河口海岸学/Estuarine and Coastal Science

姓名/Name	导师/Supervisor
张小玲/Zhang Xiaoling	杜金洲/Du Jinzhou

地图学与地理信息系统/Cartography and Geographic Information Systems

姓名/Name	导师/Supervisor	姓名/Name	导师/Supervisor
王维佳/Wang Weijia	蒋雪中/Jiang Xuezhong	余小龙/Yu Xiaolong	沈芳/Shen Fang
张晋芳/Zhang Jinfang	周云轩/Zhou Yunxuan		

海洋化学/Marine Chemistry

姓名/Name	导师/Supervisor		
季韬/Ji Tao	杜金洲/Du Jinzhou	毕倩倩/Bi Qianqian	杜金洲/Du Jinzhou
曹霄芸/Cao Xiaoyun	张经/Zhang Jing	甘淑钗/Gan Shuchai	吴莹/Wu Ying
刘宗广/Liu Zongguang	吴莹/Wu Ying	温廷宇/Wen Tingyu	杜金洲/Du Jinzhou

生态学/Ecology

姓名/Name	导师/Supervisor	姓名/Name	导师/Supervisor
刘晓臣/Liu Xiaochen	李小平/Li Xiaoping	刘钰/Liu Yu	李秀珍/Li Xiuzhen
王宁/Wang Ning	张利权/Zhang Liquan		

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
窦润青/Dou Runqing	丁平兴/Ding Pingxing	郭小斌/Guo Xiaobin	李九发/Li Jiufa
何海丰/He Haifeng	杨世伦/Yang Shilun	侯成程/Hou Chengcheng	朱建荣/Zhu Jianrong
宋泽坤/Song Zekun	程和琴/Cheng Heqin	张朝阳Zhang Chaoyang	杨世伦/Yang Shilun
周晗宇/Zhou Hanyu	朱建荣/Zhu Jianrong		

公派留学
Oversea Study Supported by China Scholarship Council

2013年，实验室共有10位学生获公派留学资格，赴荷兰、美国、英国、德国攻读学位或接受联合培养。
Ten students received China Scholarship Council scholarships to study abroad (the Netherlands, USA, UK and Germany) for Ph.D. degrees to be afforded 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
余小龙/Yu Xiaolong	荷兰/the Netherlands	特温特大学/ University of Twente
刘晓臣/Liu Xiaochen	荷兰/the Netherlands	乌特勒支大学/University of Utrecht
甘淑钗/Gan Shuchai	德国/Germany	不莱梅大学/University of Bremen

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
晏彩霞/Yan Caixia	周俊良/Zhou Junliang	美国/USA	南卡罗来纳大学University of South Carolina
谢卫明/Xie Weiming	何青/He Qing	美国/USA	佛罗里达国际大学 Florida International University
钟小菁/Zhong Xiaojing	陈沈良/Chen Shenliang	英国/UK	邓迪大学University of Dundee
姚弘毅/Yao Hongyi	李九发/Li Jiufa	美国/USA	波士顿大学Boston University
毛玉梅/Mao Yumei	李小平/Li Xiaoping	美国/USA	俄亥俄州立大学The Ohio State University
于鹏/Yu Peng	周云轩/Zhou Yunxuan	挪威/Norway	卑尔根大学University of Bergen
蒋超/Jiang Chao	陈沈良/Chen Shenliang	英国/UK	卡迪夫大学Cardiff University

海外研修
Oversea Visiting

2013年，实验室有7位同学赴美国、荷兰、英国等国家进行交流访学。
Seven students went abroad (USA, the Netherlands, and UK) as visiting students.

姓名/Name	访学单位/Visiting institute	起止时间/Date
王丰毅/Wang Fengyi	美国西北太平洋国家实验室/Pacific Northwest National Laboratory, USA	2012.04-2013.04
赵捷/Zhao Jie	荷兰代尔夫特理工大学/Delft University of Technology, the Netherlands	2013.01-2013.07
栾华龙/Luan Hualong	荷兰代尔夫特理工大学/Delft University of Technology, the Netherlands	2013.01-2013.07
王利花/Wang Lihua	欧洲航天研究所/European Space Agency, Italy	2013.01-2013.07
张迨/Zhang Dai	美国威廉玛丽大学弗吉尼亚海洋研究所/Virginia Institute of Marine Science, the College of William & Mary, USA	2013.02-2013.08
张敏/Zhang Min	英国沃林福特水文研究所/HR Wallingford Ltd, UK	2013.07-2014.01
曹浩冰/Cao Haobing	荷兰皇家海洋研究所/Royal Netherlands Institute for Sea Research	2013.12-2014.06

研究生科研成果
Research Achievements by Graduate Students

2013年研究生发表第一作者论文58篇，占实验室第一作者论文总数的51.8%，其中SCI/SCIE论文20篇(II区文章4篇)，占实验室SCI/SCIE论文的39.2%。实验室学生中有44人次参加国际学术会议，其中14人做口头报告。
The graduate students published 58 papers as first authors, among which 20 papers were published in SCI/SCIE journals. Forty four students attended international conferences with 14 oral presentations.

2013年5月，经上海市教育委员会、上海市学位委员会审核，我室2011届自然地理学专业博士生彭俊学位论文“黄河水沙变化过程及其三角洲沉积环境演变”入选2012年上海市研究生优秀成果(学位论文)。
The Ph.D. dissertation “Variation Process of Water and Sediment in the Yellow River and Evolution of Sedimentary Environment in the Yellow River Delta”, submitted by Peng Jun, was awarded the Outstanding Dissertation of Shanghai Graduate Students by Shanghai Municipal Education Commission and Academic Degree Committee of Shanghai in May.

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“2013年河口海岸学中荷优秀大学生夏令营”于2013年7月28日至31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39名大学生参加本次夏令营。夏令营期间，荷兰代尔夫特理工大学的20名大学生与中方的39名学生共同进行野外考察活动，促进了中外学生的交流。
Under the guide of East China Normal University, SKLEC hosted Excellent Students’ Summer School of Estuarine and Coastal Science during 28th -31st July, 2013. After recommendation from universities and SKLEC’s selection, finally, there were 39 excellent students participated in it. Twenty students from Delft University of Technology, the Netherlands joined the Summer School.

2013年5月我校闵行校区举行科技活动周活动，本次活动由科技部、中宣部、中国科协等19个部门共同举办。5月22日，我室助理研究员张瑞峰老师做了北极科考的讲座，向公众传播了海洋的相关科学知识。
Science and Technology Week of ECNU was held during 20th-24th May, 2013 in Minhang Campus. This activity was cosponsored by MOST, the Propaganda Department of the Central Committee of the CPC, and China Association

for Science and Technology (CAST). Dr. Zhang Ruifeng, assisstant professor of SKLEC, gave a lecture about Arctic based on his own field work experience. The general public get a chance to be closer with marine science.

2013年7月14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150名高中生及15位带队教师参观了河口海岸学国家重点实验室。我室张卫国教授和顾靖华工程师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，展示了新型海洋作业设备。
Members of the National Youth Science Camp, consisting of 150 high school students and 15 teachers, visited SKLEC on 14th July, 2013. Prof. Zhang Weiguo and Mr. Gu Jinghua introduced about SKLEC and its scientific achievements, and the technologies and equipment used for marine studies.

2013年12月2日，来自华东师范大学附属小学的30多名学生到我室参观学习。戴志军教授、施华宏教授和顾靖华工程师为学生们介绍了河口海岸的历史演变、我室的生态实验室及新型海洋作业设备。
About 30 students from Affiliated Primary School of East China Normal University visited SKLEC on 2nd, Dec., 2013. The evolution of estuaries and coasts, the ecological laboratory at SKLEC, and the marine equipment were introduced by Prof. Dai Zhijun, Prof. Shi Huahong, and Mr. GuJinghua.

学位评定分委员会
主　任：周云轩
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

SKLEC Committee for Academic Degree Assessment
Chair: Zhou Yunxuan
Deputy Chair: He Qing, Zhang Weiguo
Members: Ding Pingxing, Dai Zhijun, Du Jinzhou, Li Daoji, Li Xiuzhen, Shen Fang

研究队伍
Research Staff

- 现有固定人员57人(其中研究人员48人，技术人员7人，管理人员2人)。
  There are 57 fulltime members, including 48 academic research members, 7 technical members and 2 administrative members.
- 重点实验室客座教授沈健入选“上海千人计划”。
  Adjunct Professor Shen Jian was funded by the Shanghai Recruitment Program of Global Experts (also named Thousand Talents Program of Shanghai) sponsored by Shanghai Municipal Government.
- 侯立军教授获批国家自然科学基金委员会优秀青年科学基金。
  Prof. Hou Lijun was granted the NSFC Excellent Young Scientist Fund.
- 王张华和侯立军教授入选教育部“新世纪优秀人才支持计划”。
  Prof. Wang Zhanghua and Hou Lijun were admitted to the New Century Excellent Talent Program supported by the Ministry of Education (MOE) of China.

研究团队
Research Clusters

水沙动力学及工程应用研究中心 Center for Hydro-Sediment Dynamics and Coastal Engineering	主任：何青 成员：丁平兴、李九发、程和琴、朱建荣、孔亚珍*、吴辉、宗海波、葛建忠、王宪业、王正兵*、章可奇*、沈健*、陈长胜* Director: He Qing Members: Ding Pingxing, Li Jiufa, Cheng Heqin, Zhu Jianrong, Kong Yazhen*, Wu Hui, Zong Haibo, Ge Jianzhong, Wang Xianye, Wang Zhengbing*, Zhang Keqi*, Shen Jian*, Chen Changsheng*
动力地貌与沉积研究中心 Center for Morphodynamics and Sedimentation	主任：陈沈良 成员：杨世伦、戴志军、张国安*、李占海、李茂田*、张二凤*、韦桃源 Director: Chen Shenliang Members: Yang Shilun, Dai Zhijun, Zhang Guo'an*, Li Zhanhai, Li Maotian*, Zhang Erfeng*, Wei Taoyuan
沉积环境演变研究中心 Center for Paleoenvironmental Change	主任：张卫国 成员：陈中原、蒋辉*、王张华、李珍、陈庆强、孟翊*、孙千里*、陈静* Director: Zhang Weiguo Members: Chen Zhongyuan, Jiang Hui*, Wang Zhanghua, Li Zhen, Chen Qingqiang, Meng Yi*, Sun Qianli*, Chen Jing*
化学海洋学与生物地球化学研究中心 Center for Chemical Oceanography and Biogeochemistry	主任：杜金洲 成员：张经、吴莹、邓兵、张芬芬、朱卓毅、张瑞峰、何利军、叶祁* Director: Du Jinzhou Members: Zhang Jing, Wu Ying, Deng Bing, Zhang Fenfen, Zhu Zhuoyi, Zhang Ruifeng, He Lijun, Ye Qi*
水环境研究中心 Center for Aqua Environment	主任：李道季 成员：周俊良、李小平、程金平、杨毅*、施华宏、侯立军、高磊、郑亮 Director: Li Daoji Members: Zhou Junliang, Li Xiaoping, Cheng Jinping, Yang Yi*, Shi Huahong, Hou Lijun, Gao Lei, Zheng Liang

湿地生态研究中心 Center for Coastal Wetland Ecosystems	主任：张利权 成员：李秀珍、童春富、袁琳、闫中正、葛振鸣 Director: Zhang Liquan Members: Li Xiuzhen, Tong Chunfu, Yuan Lin, Yan Zhongzheng, Ge Zhenming
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International Roles

Name	International Organizations/Journals	Position	Term of Service
张经 Zhang Jing	IGBP-IMBER Capacity Building Task Team	Leader	2009-
	IOC/WESTPAC-CorReCAP	Project Leader	2008-
	SCOR-Committee on Capacity Building	Member	2009-
	LOICZ/IMBER-Continental Margin Task Team	Member	2011-2013
陈中原 Chen Zhongyuan	IAG-Large Rivers Working Group	Member	2001-
	EMECS-Environmental Management of Enclosed Coastal Seas	SPC Member	2004-
	IAG-International Association of Geomorphologists	Representative of China	2001-
	LGBP/LOICZ-Land Ocean Interaction Coastal Zone	SSC Member	2009-
何青 He Qing	INTERCOH Scientific Steering Committee	Member	2003-
李秀珍 Li Xiuzhen	IALE- International Association for Landscape Ecology	Council Chair	2011-2015
张经 Zhang Jing	Journal of Marine Systems	Editorial board member	2008-
	Water, Air and Soil Pollution	Editorial board member	1994-
	Water, Air and Soil Pollution: Focus	Editorial board member	1999-
陈中原 Chen Zhongyuan	Geomorphology	Editorial board member	2001-
	Estuarine Coastal and Shelf Science	Associate editor	2013-
李秀珍 Li Xiuzhen	Ecological Engineering	Editorial board member	2008-
	Journal of Conservation Planning	Editorial board member	2001-
	Wetlands Ecology and Management	Editorial board member	2012-
周云轩 Zhou Yunxuan	Ocean & Coastal Management	Editorial board member	2011-2015
周俊良 Zhou Junliang	Journal of Aquaculture Research & Development-Open Access	Executive Editor	2008-
	Journal of Chromatography and Separation Techniques-Open Access	Editorial board member	2008-
	The Scientific World Journal	Editorial board member	2009-
	ISRN Oceanography	Editorial board member	2012-
何利军 He Lijun	Open Journal of Marine Science	Editorial board member	2012-
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