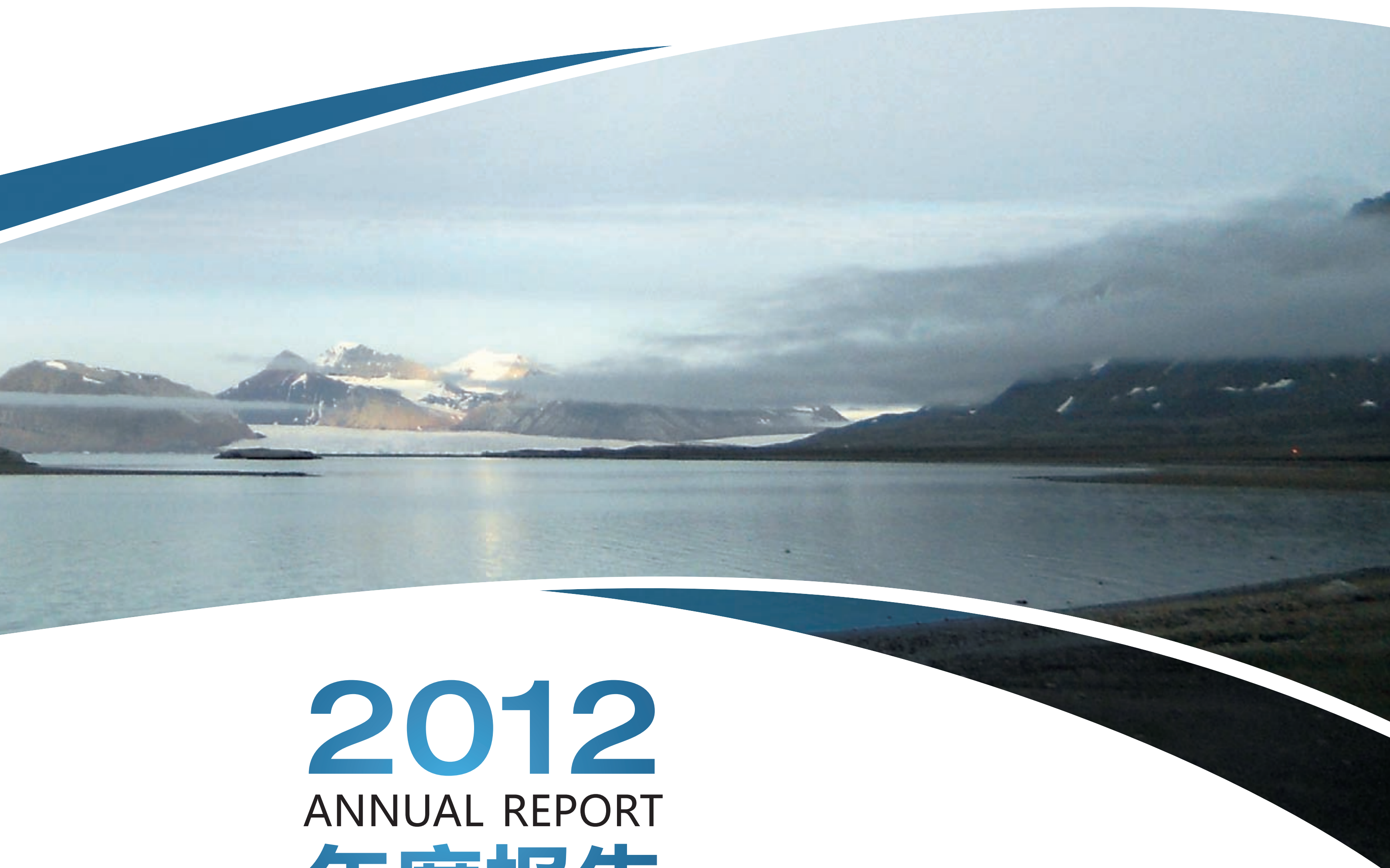
河口海岸学国家重点实验室
（华东师范大学）
State Key Laboratory of Estuarine and Coastal Research
(East China Normal University)



2012
ANNUAL REPORT
年度报告

河口海岸学国家重点实验室（华东师范大学）

2012 年度报告

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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

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实验室简介
SKLEC Introduction

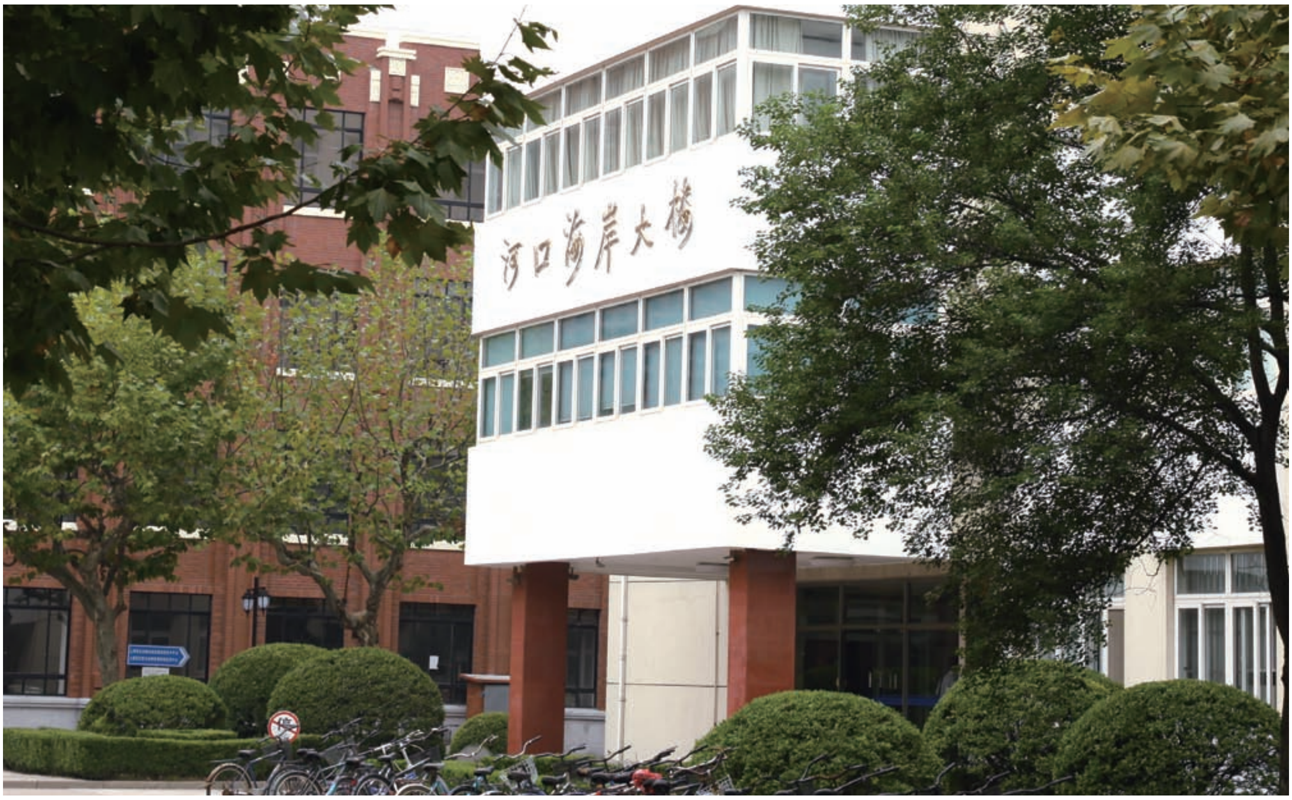
河口海岸学国家重点实验室是在华东师范大学河口海岸学科 30 多年研究工作的基础上创建的。实验室依托华东师范大学，于 1989 年由国家计委批准筹建，1995 年 12 月通过国家验收并正式向国内外开放。

经过二十多年的建设，实验室已拥有一支结构合理、多学科交叉、专业互补、老中青结合的研究队伍；配备了先进的野外勘测及室内测试与分析仪器。实验室现有固定人员 60 人，其中研究人员 49 人 (教授 27 人，副教授 10 人，讲师 12 人；具有博士学位的 45 人)，技术人员 8 人，管理人员 3 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) for more than 30 years. 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 60 fulltime faculties and staff members in the laboratory, which include 49 research faculties (27 professors, 10 associate professors, and 12 lecturers, among them 45 with Ph.D. degree), 8 technicians and 3 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 on estuaries and coasts. Guided by the philosophy of “Openness, Exchange, Cooperation and Competition”, it has become a high level research and training base for estuarine and coastal studies in China.



大事记
Headlines

2012 年 7 月 31 日至 8 月 4 日，我室主办了海洋生物地球化学与生态系统整合研究 (IMBER) 能力建设需求评估国际研讨会。该会议拟通过对以往相关领域能力建设活动的评估，在海洋生物地球化学和生态系统整合研究领域能力建设规划和策略的制定方面为全球、尤其是亚太地区国家的相关组织和决策者提供科学的依据。本次会议得到了国际 IMBER 计划和亚太全球变化研究网络 (APN) 的共同资资助。

To enhance Integrated Marine Biogeochemistry and Ecosystem Research (IMBER) in the Asia-Pacific region, an international workshop on “Needs assessment for capacity development for IMBER in the Asia-Pacifi c region" to assess capacity development for IMBER research was held during July 31 – August 4 at the State Key Laboratory of Estuarine and Coastal Research (SKLEC). The main objective of this workshop is to assess the efficacy of previous capacity development activities and to provide relevant agencies, as well as decision makers with a scientific basis for developing a capacity development strategy to enhance IMBER research particularly in the Asia-Pacifi c region. This workshop was co-sponsored by IMBER, APN (Asia-Pacific Network Research) and SKLEC, East China Normal University.

2012 年 9 月，我室推荐申报的王正兵教授成功入选国家教育部 2011 年度“长江学者奖励计划”讲座教授。

Prof. Wang Zhengbing was appointed as Chang Jiang Scholar Endowed Chair Professor by the Ministry of Education (MOE) of China in September 2012.

2012 年 9 月 3 号，上海市教育委员会公布华东师范大学地理学被列入上海高校一流学科 (A 类) 建设行列，建设目标是具有冲击国际一流学科的能力和影响力。以河口海岸为特色的自然地理学研究，是该学科建设的重要内容。

On September 3, 2012, Shanghai Municipal Education Commission announced that the discipline Geography of East China Normal University was incorporated into the “Top Discipline Development Program” (Class A) among universities in Shanghai. The aim of this program is to develop disciplines of international excellence. Physical Geography, featured with estuarine and coastal research, is one of the major sub-disciplines of this program.

2012 年 10 月 28 日，我室成立了国际咨询委员会，第一次会议在上海召开，来自美国、英国、德国、荷兰、瑞士、挪威和爱沙尼亚等国家的二十多位知名专家出席会议，并对实验室的发展、国际化进程等提出了中肯的建议。

International Consultation Panel of SKLEC was established and the first meeting was held in Shanghai on October 28, 2012. More than 20 international scientists from the United States, the United Kingdom, Germany, the Netherlands, Switzerland, Norway and Estonia attended the meeting. They proposed precious comments and suggestions on many aspects of the SKLEC's internationalization endeavor.

2012年10月29日至31日，我室主办的“海岸带对人类活动和气候变化的响应与适应”国际会议在华东师范大学召开，来自荷兰、美国、英国、德国、挪威、中国等10多个国家的100余名科研人员参加了本次会议。会议就人类活动对河口海岸带的影响、河口生态系统与生态服务、物质的源汇运移与环境影响、河口潮滩的未来、海岸脆弱性评估与模拟、海岸带适应与应对气候变化的策略等议题进行了热烈交流和讨论。

The international symposium “Climate Change and Human Activities: Coastal Consequences and Responses”, organized by SKLEC, was held from October 29 to November 1, 2012 at East China Normal University (ECNU). The meeting attracted more than 100 researchers from more than 10 countries, including the Netherlands, the United States, the United Kingdom, Germany, Norway and China. The themes of the symposium were: 1) Impacts of human activity on the estuaries and coasts; 2) Impacts of climate change on the estuaries and coasts; 3) Coastal eco-systems and eco-services; 4) Material transport from source to sink and environmental effects; 5) Fate of tidal flats in estuaries; 6) Coastal vulnerability, assessment proxies and models; 7) Coastal adaptation and strategies for coping with climate change.

2012年11月10日，我室与中交第三航务工程勘察设计院有限公司联合提出的“上海国际航运中心横沙浅滩挖入式港池规划方案研究报告”召开了专家评审会。专家组对该份研究报告给予高度评价，认为该研究报告具有前瞻性、设时性和可行性，对上海国际航运中心的持续发展具有重要的价值，可作为国家相关部门在长江口规划新港区时的重要参考依据。

Expert evaluation meeting on “Report of Planned Excavated Harbor in Hengsha Shoal for Shanghai International Shipping Center” took place on November 10, 2012. This report is proposed by SKLEC and Third Harbor Consultants Co., Ltd of China Communications Construction Company. The experts gave high appraisement to the report, and recommended that the report is an important reference document for future new harbor plan and design in the Yangtze River Estuary.

2012年实验室与国家海洋局东海分局联合申请，首次获得国家自然科学基金委资助的长江口科学调查公共航次资助，并顺利完成冬夏两季航次调查任务。

Jointed by the East China Sea Branch of State Ocean Administration of China, SKLEC won the Yangtze River Estuary scientific investigation fund from the National Natural Science Foundation of China (NSFC) for the first time in 2012. Two cruises in winter and summer were successfully carried out.

2012年12月21日~23日，国家计量认证海洋评审组对实验室进行了国家计量认证复查、扩项现场评审。经过全面考核，评审组确认了海洋水文、海洋测绘、水质、沉积物/土壤和生物体5个类别56项参数计量认证的检测能力，其中24项为新增的放射性核素检测项目。

SKLEC received the national metrological evaluation by the Marine Review Group of Certification and Accreditation Administration of China during December 21-23, 2012. According to the results of examination and evaluation, the Marine Review Group confirmed that SKLEC is eligible in the measurements of 56 items in the field of marine hydrology, marine survey, water, sediment/soil and organism analysis, among which 24 radionuclide analyses items are the expanded new items.

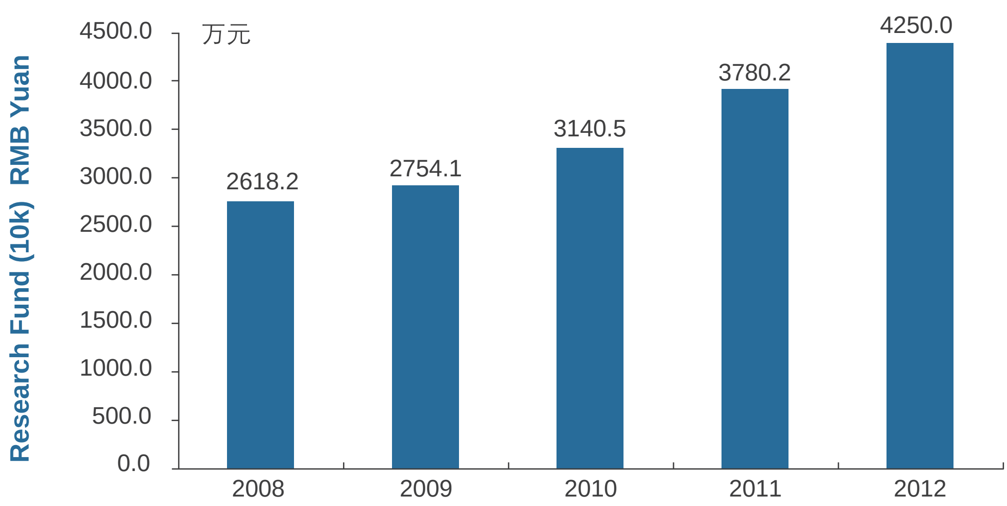
2012年12月29-30日，我室第五届学术委员会第二次会议在上海召开。

The 2nd meeting of the 5th SKLEC Academic Committee was held in Shanghai during December 29-30, 2012.

科研经费和科研课题
Research Grants & Program Highlights

2012 年实验室承担国家和省部委各类项目 140 余项 (包括新增科研课题 47 项)，其中承担国家级项目 49 项，实到经费 1933 万元；省部委课题 32 项，实到经费 1077 万元；横向协作课题 53 余项，实到经费 691 万元；国际合作课题 12 项，实到经费 49 万元。此外，实验室还获得科技部国家重点实验室专项经费 900 万元，其中 500 万元用于自主研究课题的部署，400 万元用于实验室管理运行和开放课题；获得科技部国家重点实验室仪器设备更新专项资助 562 万元；获得华东师范大学“985”仪器设备经费 530 万元。

More than 140 research projects were granted in 2012, including 47 new projects. Among them, 49 projects of national level totaled 19.3 million RMB, 32 provincial and ministerial level projects 10.8 million RMB, 53 enterprise projects 6.9 million RMB, and 12 international cooperation projects 0.49 million RMB. In addition, SKLEC received special funding from the Ministry of Science and Technology (MOST) of China, among which 5 million RMB was targeted at scientifi c research, 4 million RMB for administration and operation of SKLEC, and 5.62 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.



2008-2012 年实到科研经费
Competitive Research Funding in 2008-2012

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

国家自然科学基金委重点项目：三峡工程对长江河口 - 三角洲动力沉积过程和地貌演化的影响 (41130856)
NSFC Key Project: Effect of Three Gorges Project on Dynamical Sedimentation and Geomorphological Evolution of the Yangtze River Estuary and Delta (2012.01-2015.12)

本项目由华东师范大学和中国海洋大学共同承担。本项目拟定量剥离三峡工程对入河口水沙通量长期趋势和季节性节律的影响；在高密度、长时间序列的河口 - 三角洲悬沙浓度、地貌冲淤、沉积物粒径及其影响因素综合分析的基础上，提取河口 - 三角洲沉积地貌过程对流域入河口水沙长期和季节性变化响应的信息；进而结合三峡工程对入河口水沙影响的评价结果，剥离三峡工程对河口 - 三角洲动力沉积过程和地貌演化的影响。
The partners are East China Normal University and Ocean University of China. The project focus on 1) quantify the impact of the Three Gorges Dam on long term trends of water and sediment flux into estuary and seasonal rhythm; 2) reveal the response of geomorphic process of estuary-delta to fluvial water and sediment flux variations

and its seasonal change; 3) identify the influence of the Three Gorges Dam on the dynamic sedimentation and geomorphological evolution of river delta.

国家自然科学基金委公共航次项目：长江口科学考察实验研究 (41149902)
NSFC Public Cruise Fund: Scientific Investigation on the Yangtze River Estuary (2012.01-2012.12)

本项目由实验室与国家海洋局东海分局联合承担，朱建荣教授为航次首席科学家，并已顺利完成冬夏两季航次调查任务。观测学科涉及海洋物理、海洋化学、海洋地质和海洋遥感等，参加单位有华东师范大学、中国海洋大学、同济大学和国家海洋局第二海洋研究所等。
The East China Sea Branch of State Ocean Administration and SKLEC. Prof. Zhu Jianrong acted as the principal investigator of the cruises. Two cruises in winter and summer were successfully completed. The disciplines involved in the investigation included physical oceanography, marine chemistry, marine geology and remote sensing. Research members from East China Normal University, Ocean University of China, Tongji University and the Second Institute of Oceanography of State Oceanic Administration of China joined the cruises.

科技部国家科技重大专项课题：三峡水库富营养化演化的生态动力机制及过程模拟研究 (2012ZX07104-001)
MOST National Scientific and Technological Key Special Program: Ecological Dynamical Mechanism and Simulation of Eutrophication Evolution in the Three Gorges Dam (2012.01-2015.12)

本课题系由中国水利水电科学研究院、中国科学院遥感应用研究所、重庆市环境科学研究院、华东师范大学和华中农业大学共同承担的科技部国家科技重大专项“不同水位运行下水环境问题诊断及生态安全保障研究”的专题，课题拟定量描述三峡水库运用对全库区和水华多发区域的特殊水文水动力学过程和对营养物质迁移、扩散、转化过程的作用机理，阐明水体交换过程的环境意义，刻画三峡水库高水位运用造成的生源要素入库机制改变，量化表征水库高水位运用对水体真光层环境特性的直接、间接影响，模拟水库运用后水华生消的生态动力学机制，实现对库区水华生消过程的物理 - 生态过程的精确模拟，评估水华暴发的中长期风险，在深刻认识富营养演化规律的基础上提出水华防控策略优化方案。
The project is a sub-project of “Water Environment Diagnosis and Ecological Security Safeguard under Different Water Level”, which is supported by MOST National Scientific and Technological Key Special Program. The partners are China Institute of Water Resources and Hydropower Research, Institute of Remote Sensing Applications of Chinese Academy of Sciences, Institute of Environment of Chongqing Province, East China Normal University, and Huazhong Agricultural University. It aims to 1) describe the effect of the dam on hydrodynamics process of the reservoir area and the water bloom area, and migration, diffusion and transformation process of nutrients; 2) clarify environmental consequence of water exchange process; 3) describe the influx change of bioavailable nutrients into the reservoir; 4) characterize the direct and indirect impact of high water level on euphotic zone; 5) simulate eco-dynamic mechanism of the formation and disappearance of water bloom; 6) simulate the physical-ecological process of the formation and disappearance of water bloom; 7) assess middle-term and long-term risk of water bloom; 8) propose optimum strategy for water bloom control.

上海市科委社发领域重大项目：长江口泥沙资源与综合利用研究 (12231203100)
Science and Technology Commission of Shanghai Municipal Government Major Project: Sediment Resources of the Yangtze River Estuary and Its Comprehensive Utilization (2012.10-2014.09)

本项目由华东师范大学与上海勘测设计研究院、上海河口海岸科学研究中心、上海市水务规划设计研究院 (上海市海洋规划设计研究院) 共同承担。项目拟通过对长江河口泥沙资源的分布格局和变化趋势、长江口低滩促淤圈围技术与应用示范、长江口深水航道疏浚土利用关键技术和上海市泥沙资源可持续利用方案的研究，为长江口泥沙资源的高效利用和今后上海促淤圈围造地提供技术导则，科学评估典型河口重大围垦工程对河势的影响。
The partners are East China Normal University, Shanghai Investigation, Design and Research Institute, Shanghai Estuarine & Coastal Science Research Center, and Shanghai Water Planning and Design Research Institute (Shanghai Ocean Planning and Design Research Institute). It focus on: 1) distribution pattern and change of sediment resources in the Yangtze Estuary; 2) reclamation technology of low tidal flat in the Yangtze Estuary and its engineering demonstration; 3) key technology of deep water channel dredged sediment use; and 4) sustainable utilization plan of sediment resources in Shanghai. It will provide technological guide for efficient utilization of sediment resources and land reclaimation in the Yangtze Estuary, and scientific assessment of the impact of major reclamation project on estuarine geomorphology.

部分新增项目
Selected New Projects

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国家自然科学基金青年科学基金项目 NSFC Young Scientist Fund	
河口水质模型中的沉积物 - 水界面氮交换研究 (41106074) Estuarine Water Quality Model for Nitrogen Exchange at Sediment-Water Interface (2012.01-2014.12)	宗海波 Zong Haibo
长江口生源要素与悬浮颗粒物粒径谱之间相互关系的初步研究 (41106098) Relationship between Biogenic Elements and the Size Spectrum of Suspended Particles in the Yangtze River Estuary (2012.01-2014.12)	高磊 Gao Lei
国家公益性项目 National Public Welfare Project	
海洋预报业务化系统模块化构建与应用示范 (国家海洋局) (201205017) Modular Construction of Marine Forecasting Operational System and its Application Demonstration (State Oceanic Administration of China) (2012.01-2015.12)	丁平兴 Ding Pingxing
长江口水文监测站网功能评价的技术方法研究 (国家水利部) (201201068) Functional Assessment Technique for Hydrological Monitoring Station Network in the Yangtze River Estuary (Ministry of Water Resources of China) (2012.03-2014.12)	何青 He Qing

长江口近期演变及工程响应研究 (国家水利部) (201201070-03) The Yangtze River Estuary Evolution and its Engineering Response (Ministry of Water Resources of China) (2012.06-2014.12)	何青 He Qing
国际合作项目 International Cooperation Project	
河口沉积羽流及潮滩对人类活动和气候变化的响应 (中国科技部与欧洲空间局合作项目—龙计划 3 期) (DRAGON 3 Id. 10555) Variations of Estuarine Turbid Plumes and Mudflats in Response to Human Activities and Climate Change (The ESA-MOST Dragon 3 Programme) (2012.06-2016.05)	沈芳 Shen Fang
基于多卫星传感器和数值模拟的河口近岸水动力与生物光学研究 (中国科技部与欧洲空间局合作项目—龙计划 3 期) (DRAGON 3 Id. 10593) Investigating Coastal Zone and Open Ocean Dynamics and Bio-Optical Conditions by Satellite Sensor Synergy in Combination with In-Situ Data and Simulation Models (The ESA-MOST Dragon 3 Programme) (2012.06-2016.05)	周云轩 Zhou Yunxuan
人口密集三角洲的健康、生计、生态系统服务和减轻贫困 (英国 ESPA 计划重大项目) (NE/J001902/1) Assessing Health, Livelihoods, Ecosystem Services and Poverty Alleviation in Populous Deltas (NERC Ecosystem Services for Poverty Alleviation Programme, UK) (2012-2016)	陈中原 Chen Zhongyuan
长江口溶解有机氮研究：以氨基酸手性对应体为例 (国际科学基金委员会) (A/5112-1) A Study on Dissolved Organic Nitrogen in the Yangtze River Estuary: Begin with Amino Acids Enantiomers (International Foundation for Science) (2012.02-2014.02)	朱卓毅 Zhu Zhuoyi
省部级项目 Projects Funded by Provincial and Ministerial Commission	
无法忽视 全球小型渔业研究伙伴计划 (加拿大社会科学和人文研究委员会) (895-2011-1011) Social Sciences and Humanities Research Council of Canada: Too Big To Ignore (TBTI): Global Partnership for Small-scale Fisheries Research (2012-2016)	程和琴 Cheng Heqin
长江口泥沙资源与综合利用研究 (上海市科委社发领域重大项目) (12231203100) Sediment Resources and Comprehensive Utilization of the Yangtze River Estuary (Science and Technology Commission of Shanghai Municipal Government Major Project) (2012.10-2014.09)	陈吉余 Chen Jiyu
气候变化和人类活动对西太平洋地区珊瑚礁体系的影响 (国家海洋局) (2010-FPSCS-01-02-01) Effect of Climate Change and Human Activity on Coral Reef System in West Pacific Ocean (State Oceanic Administration of China) (2012.06-2014.12)	张经 Zhang Jing
广西重点港湾沉积动力调查 (国家海洋局 908 专项) (GX908-01-08) Sedimentary Dynamic Investigation of Key Harbor in Guangxi Province (908 Special Project of State Oceanic Administration of China) (2012.06-2013.12)	陈沈良 Chen Shenliang
厌氧氨氧化细菌在长江口低氧区作用的研究 (上海市浦江人才计划) (12PJ1403100) Diversity and Function of Anaerobic Ammonium Oxidizing Bacteria in the Hypoxic Zone off the Changjiang (Yangtze River) Estuary (Shanghai Pujiang Talent Plan) (2012.10-2014.09)	叶祁 Ye Qi
波流共同作用下潮滩水流紊动对泥沙起动和再悬浮的影响研究 (上海市自然科学基金青年项目) (12ZR1443200) Response of Sediment Activation and Resuspension under the Influence of Wave-Current Interaction (Science and Technology Commission of Shanghai Municipal Government Young Scientist Fund) (2012.10-2015.09)	王宪业 Wang Xianye

科技部实验室专项基金
MOST Special Fund

2012 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 3 项。
Laboratory special fund, supported by the Ministry of Science and Technology (MOST) of China, granted seven research cluster projects and three projects for new 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)。2012年，各团队研究的主要内容为：中全新世快速海平面变化及其地貌响应、遥感测量技术与方法研究——以浑浊水体光学特性测量和海岸带湿地调查为例、长江口滨海湿地碳累积时空格局及其形成机制研究、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、海南东部潟湖地下水排泄通量研究、人类活动对三角洲动力沉积地貌过程影响的自然机制、横沙浅滩挖入式港池可能性分析研究。
Each research cluster was granted a three-year (2012-2014) project with a total of 1.5 million RMB. In 2012, the research contents carried out by the research clusters include: 1) Rapid sea level change in mid-Holocene and its geomorphic response, 2) Techniques and methods of remote sensing measurement: Case studies in the measurement of optical properties of turbid coastal waters and the investigation of coastal wetlands, 3) Spatial and temporal pattern of coastal wetland carbon accumulation in the Yangtze Estuary and its formation mechanism, 4) New emerging pollutants in the Yangtze River Estuary and coastal region: Environmental behavior, combined pollution and ecotoxicological study, 5) Submarine groundwater discharge flux into lagoons in the Eastern Hainan Island, 6) Natural mechanism of human activities on delta dynamic sedimentary and geomorphic process, 7) Possibility study of Hengsha excavated harbor.

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 Changes
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 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 New Faculties

项目名称 Project	负责人 Investigator
长江口典型药物污染物的生态毒理研究 Ecotoxicology of Typical Drug Pollutants in the Yangtze Estuary	程金平 Cheng Jinping
重金属胁迫下红树幼苗内外源胁迫激素的相互作用及其对幼苗抗逆性意义的研究 Interaction of Exogenous/Endogenous Phytohormones in Mangrove Seedlings under Heavy Metal Stress and Its Significance in Stress Adaptation	闫中正 Yan Zhongzheng
长江口滨海湿地碳源 / 汇时空格局形成机制及对气候变化的响应 Spatiotemporal Pattern Formation of Carbon Source/Sink and Its Response to Climate Change in the Yangtze Delta Coastal Wetlands	葛振鸣 Ge Zhenming

交流与合作
Academic Exchange & Cooperation

实验室积极开展国际交流与合作，目前承担了“龙计划”3期、英国“生态系统服务与扶贫”计划、中荷战略科学联盟计划、欧盟第七框架等国际合作项目 11 项。
SKLEC is active in international exchange and cooperation. Currently, SKLEC is involved in a number of internationally cooperation projects, such as The ESA-MOST Dragon 3 Programme, Ecosystem Services for Poverty Alleviation (ESPA) Programme, Programme Strategic Scientifi c Alliances between China and the Netherlands (PSA), and EU 7^{th} Framework Project.

2012 年实验室有 50 余人次参加国际学术会议，并有 5 人次做特邀报告；30 余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 130 多人次。主 / 承办 4 次国际会议以及 1 次国内学术研讨会。2012 年实验室共举办学术报告近 90 场次。
In 2012, SKLEC faculties participated in international conferences for more than 50 person-times, including 5 invited talks. There were more than 30 person-time visiting abroad, and more than 130 person-time foreign experts visiting SKLEC. In 2012, SKLEC hosted four international conferences, as well as one national conference. In total, nearly 90 lectures were given in SKLEC.

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

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 Programme: Variations of Estuarine Turbid Plumes and Mudfl ats in Response to Human Activities and Climate Change (2012.06-2016.05)

本项目由中国科技部与欧洲空间局资助，中方承担单位为华东师范大学，外方为荷兰屯特大学和法国国家科学研究中心 Villefranche 海洋实验室。项目的主要研究内容包括：1) 校准及检验对地观测在浑浊海岸水域的海洋水色产品，分析对比以高悬沙浓度为特点的长江口和吉伦特河口的沉积羽流的动态变化，以及人类活动和全球气候变化影响下的响应；2) 卫星反演算法的改进及未来观测任务的建议，扩展交叉研究领域及对地观测数据在国际海岸观测计划 (如 IMBER, LOICZ, MAB 等) 中的应用；3) 通过对地观测，研究生态系统管理、沿海水质状况的评估、河口生态系统对人类活动的响应等。
The project is co-funded by the Ministry of Science and Technology (MOST) of China and European Space Agency (ESA). The Chinese partner is East China Normal University. The foreign partners are University of Twente, the Netherlands and Laboratoire d'Océanographie de Villefranche (LOV) of the French National Center for Scientific Research (CNRS). The project focus on: 1) calibrating and examining ocean color products in turbid coastal water by earth observation, and analyzing the dynamic change of plumes in the Yangtze River Estuary with high suspended sediment concentration and Gironde Estuary, and their response to human activites and global climate change; 2) improving practical satellite remote sensing algorithms, promoting interdisciplinary study and the application of earth observation data in international coastal observation programme (such as IMBER, LOICZ, and MAB); 3) management of ecosystem, assessment of coastal water quality, and the response of estuarine ecosystem to human activity using earth observation data.

中国科技部与欧洲空间局合作项目—龙计划 3 期：基于多卫星传感器和数值模拟的河口近岸水动力与生物光学研究 (DRAGON 3 Id. 10593)
The ESA-MOST Dragon 3 Programme: Investigating Coastal Zone and Open Ocean Dynamics and Bio-Optical Conditions by Satellite Sensor Synergy in Combination with In-Situ Data and Simulation Models (2012.06-2016.05)

该项目由中国科技部与欧洲空间局资助, 中方承担单位为华东师范大学, 外方为挪威 Nansen 环境遥感中心 (NERSC)。该项目以长江口为研究区域，应用 SAR 和现场观察，开展河口淡水径流量、浅水地形变化监测、高浊度水体生物光学模型浮游生物提取算法、长江河口毗邻水域 CDOM 与盐度间的大尺度关系模型构建等研究。

The project is co-funded by the Ministry of Science and Technology (MOST) of China and European Space Agency (ESA). It is jointly undertaken by SKLEC and Nansen Environmental and Remote Sensing Center (NERSC). The main tasks are: (1) estimating and monitoring the Yangtze River freshwater runoff (surface speed and speed variability) from the SAR based range Doppler shift anomaly observations; (2) monitoring of changes in shallow water bathymetry in the coastal zone region around Shanghai based on SAR observations in combination with dredging data and a simple 3D barotropic ocean simulation model; (3) developing and validating a regional-to-local phytoplankton retrieval algorithm that accounts for the local bio-optical conditions; (4) establishing regional relationship between CDOM and salinity in vicinity of the Yangtze River mouth.

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)

本项目为我室独立承担的瑞典国际科学基金资助的项目。项目拟通过长江口的手性氨基酸研究，研究：1) 长江口颗粒有机物的早期成岩特征；2) 长江口有机质在强烈人为活动影响下的迁移和分布特征；3) 长江口微生物活动对有机质输送的影响。

This project is supported by International Foundation for Science (IFS). Taking amino acids enantiomers as an example, it focus on the following aspects: 1) early diagenesis of dissolved organic matter in the Yangtze River Estuary; 2) transportation and distribution of dissolved organic nitrogen in the Yangtze River Estuary in the context of strong anthropogenic activities in the drainage basin, 3) role of estuarine microbial activities in terms of transforming organic matter by the Yangtze River.

英国 ESPA 计划重大项目：人口密集三角洲的健康、生计、生态系统服务和减轻贫困 (NE/J001902/1)

Consortium Project of Ecosystem Services for Poverty Alleviation (ESPA) Programme: Assessing Health, Livelihoods, Ecosystem Services and Poverty Alleviation in Populous Deltas (2012-2016)

该项目为我室参与的英国 ESPA 计划的资助的一项重大项目，由英国自然环境研究理事会、经济与社会研究理事会、国际发展部三个机构联合资助。项目研究内容为恒河三角洲的生态系统服务与可持续发展，研究团队包括南安普顿大学、牛津大学等著名研究机构, 我室是英方以及研究区域所在地的孟加拉和印度研究机构之外的唯一外国合作团队。

The consortium project is co-supported by UK Natural Environment Research Council (NERC), The Economic and Social Research Council (ESRC) and Department for International Development (DFID). It focuses on ecosystem service and sustainable development of the Ganges River Delta. The research team is consisted of famous research institutions in UK, including University of Southampton and University of Oxford. SKLEC is the only oversea partner except the research institutions located in the research area, i.e., Bangladesh and India.

加拿大社会科学和人文研究委员会项目：无法忽视：全球小型渔业研究伙伴计划（895-2011-1011）

Social Sciences and Humanities Research Council of Canada: Too Big To Ignore (TBTI): Global Partnership for Small-scale Fisheries Research (2012-2016)

本项目由加拿大社会科学和人文研究委员会资助，来自世界 27 个国家和包括联合国粮农组织在内的 15 个政府间和非政府间国际组织参与了此项目。该项目是一个新成立的研究网络和知识共享伙伴计划，目的在于纠正目前国家和国际政策对小型渔业的日益边缘化理解，发展研究和管理能力以应对全球渔业挑战。华东师范大学主要承担“海洋经济开发区小型渔业的合理规模研究”。

Too Big to Ignore is supported by the Social Sciences and Humanities Research Council of Canada. The Global Partnership for Small-Scale Fisheries Research, *Too Big to Ignore*, is a new research network and knowledge mobilization partnership established to rectify the marginalization of small-scale fisheries in national and international policies, and to develop research and governance capacity to address global fisheries challenges. The East China Normal University mainly responsible for the rational small scale fisheries in an ocean economic developing zone, northwest Pacific Ocean.

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)

2012 年，本项目进行了 2 次现场观测，在获取潮流和含沙量数据同时，获得了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。荷兰方乌特勒支大学的 H.E.de Swart 教授和 Niels C. Alebregtse 博士访问我室，并于 11 月 28-30 日项目中期进展报告会上交流和总结前期研究进展和成果。在河口细颗粒泥沙特性、河口水沙半解析计算、水沙运动规律等方面取得一些研究成果，中荷双方完成中外文学术论文 5 篇，其中 3 篇已发表。

Two field observations of tides and suspended sediments were carried out in 2012, which provided the first hand data for the study of fine sediment behaviors and sediment resuspension in the Yangtze River Estuary. Prof. H.E.de Swart and Dr. Niels C. Alebregtse from Utrecht University, the Netherlands visited SKLEC, and exchanged research progress at the mid-term meeting during November 28-30, 2012. Five papers were produced, and three of them have been published, which reported the progress in estuarine fine sediment characteristics, semi-analytical calculation of estuarine water and sediment and their transportation mechanisms.

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)

2012 年，围绕项目研究内容，采集了长江口柱样，用于沉积物中各种磷形态的准确分析，并就方法流程与荷方进行比对。结合原有柱样的有机地球化学分析工作，探讨了色素组成与低氧历史可能存在的联系，将观测到的 Chla 值用早期成岩模型扣除早期成岩作用之后，得到的修正 Chla 值 (virtual Chla) 和当年水体中实测 Chla 值及历史事件 (用长江径流量表示) 较好的吻合，说明光合色素可用于低氧历史重建。

In 2012, cores from the Yangtze River Estuary were collected for analysis of phosphorus forms in sediment, and a mythological comparison between China and the Netherlands was made. Combined with the previous organic geochemistry analysis, the probable link between pigments composition and low oxygen history was discussed. The virtual Chla was calculated from the observed Chla value after considering the diagenesis effect of organic matter using early diagenesis model. The virtual Chla values compared well with the measured Chla values in water in corresponding years, suggesting that photosynthetic pigments can be used for low oxygen history reconstruction.

学术会议
Workshop & Conference

海洋生物地球化学与生态系统整合研究能力建设需求评估国际研讨会
Needs Assessment for Capacity Development for IMBER in the Asia-Pacific Region

该会议于 2012 年 7 月 31 日至 8 月 4 日在我室举行。IMBER 能力建设工作组成员与来自 16 个国家的 20 余位能力建设专家一起，对全球特别是亚太区域海洋研究领域的能力建设活动进行全面的分析，总结前期经验、发现存在问题、改进不足之处。该研讨会通过对以往相关领域能力建设活动的评估， 在海洋生物地球化学和生态系统整合研究领域能力建设规划和策略的制定方面， 为全球、尤其是亚太地区国家的相关组织和决策者提供科学的依据。

Together with capacity building experts from other organizations, members of the IMBER Capacity Building Task Team conducted research using a case study approach to assess capacity building efforts undertaken in the Asia-Pacific region, and hold an international workshop during July 31 - August 4, 2012 at SKLEC, East China Normal University (ECNU), Shanghai, China. This workshop facilitated analysis and evaluation of these efforts and identify capacity development needs that still need to be addressed. The results of this workshop provided IMBER, relevant international agencies and decision makers with a scientific basis for developing a capacity building strategy to enhance integrated marine biogeochemistry and ecosystem research in the Asia-Pacific region.

SKLEC 国际化咨询会
SKLEC Internationalization Consultation Meeting

2012 年 10 月 28 日，来自海外的 20 多位专家和我室的数十名教授参加了我室的国际委员会第一次国际化咨询会议，各位专家就实验室国际化建设、扩展合作交流等方面提出了宝贵意见。

International Consultation Panel of SKLEC was established and the first meeting was held at SKLEC on October 28, 2012. More than 20 international experts from the United States, the United Kingdom, Germany, the Netherlands, Switzerland, Norway, and Estonia attended the meeting. They proposed precious comments and suggestions on many aspects of the SKLEC's internationalization endeavor.

海岸带对人类活动和气候变化的响应与适应
International Symposium on Climate Change and Human Activities: Coastal Consequences and Responses

该会议于 2012 年 10 月 29-31 日在上海召开，由我室主办。来自荷兰、美国、英国、德国、挪威、中国等 10 多个国家的 100 余名科研人员参加了本次会议。会议议题包括：人类活动对河口海岸带的影响、河口生态系统与生态服务、物质的源汇运移与环境影响、河口潮滩的未来、海岸脆弱性评估与模拟、海岸带适应与应对气候变化的策略。这次会议的成功召开促进了不同国家与地区河口海岸科学领域研究人员的交流与合作，为建立合作打下坚实的基础，以推动我国河口海岸科学的进一步发展；展现了我国河口海岸科学领域的研究水平，扩大了我国研究人员的国际视野。

The international symposium "Climate Change and Human Activities: Coastal Consequences and Responses", organized by SKLEC, took place from October 29 to November 1, 2012 at East China Normal University (ECNU). The meeting attracted more than 100 researchers from more than 10 countries, including the Netherland, the United States, the United Kingdom, German, Norway and China. The themes of the symposium are: 1) Impacts of human activity on the estuaries and coasts; 2) Impacts of climate change on the estuaries and coasts; 3) Coastal eco-systems and eco-services; 4) Material transport from source to sink and environmental effects; 5) Fate of tidal flats in estuaries; 6) Coastal vulnerability, assessment proxies and models; 7) Coastal adaptation and strategies for coping with climate change. This symposium successfully enhanced the cooperation and exchange between researchers from different areas, and contributed to the Chinese estuarine and coastal studies. Meanwhile, this symposium not only presented Chinese research ability in estuarine and coastal area, but also broaden Chinese researchers' international perspectives.

中荷战略科学联盟计划项目 (PSA) 双边会议
Programme Strategic Scientific Alliances between China and the Netherlands (PSA) Bilateral

2012 年 11 月 1 日，中荷战略科学联盟计划项目 (PSA) 双边会议在我室召开，该项目由荷兰皇家科学院和中国科技部资助，中方合作伙伴为河口海岸学国家重点实验室和清华大学水沙科学与水利水电工程国家重点实验室；荷方为代尔夫特理工大学 (TU Delft) 和荷兰皇家科学院生态研究所 (NIOO)。来自中荷双方的 30 多位学者参加了本次会议，双方学者交流整合不同特色河口的知识和经验，并逐渐提升得到的结论和认识，并就明年结题的准备和下一轮项目的申请进行了深入讨论。

PSA Project Meeting was held at SKLEC on November 1, 2012. This project is supported by the Royal Netherlands Academy of Arts and Sciences (KNAW) and Ministry of Science and Technology (MOST) of China. The Chinese partners are SKLEC and State Key Laboratory of Hydroscience and Engineering, Tsinghua University. The Dutch partners are Delft University of Technology and The Netherlands Institute of Ecology, Royal Netherlands Academy of Arts and Sciences (NIOO-KNAW). More than 30 project participants attended this meeting to share the knowledge and experience in estuarine studies. Issues related to the preparation of final report and application of next phase project was discussed at this meeting.

专家学者来访
Visiting Scholars

2012 年实验室接待国内外学者、专家来室合作研究与学术交流 120 多人次。
In 2012, more than 120 scholars visited SKLEC.

List of Visitors

专家 Visiting Scholar	单位 Affiliation	来访时间 Visiting Period
Ulo Mander	爱沙尼亚塔尔图大学 / Tartu University, Estonia	2012.10.26-2012.10.31
Sarah Rogers	澳大利亚墨尔本大学 / University of Melbourne, Australia	2012.5.1-2012.10.31
Brian Finlayson	澳大利亚墨尔本大学 / University of Melbourne, Australia	2012.6.10-2012.11.10
Eric Wolanski	澳大利亚詹姆斯库克大学 / James Cook University, Australia 澳大利亚海洋科学研究所 / Australian Institute of Marine Science, Australia	2012.9.9-2012.9.25
Syed Waseem Haider	巴基斯坦国家海洋研究所 / National Institute of Oceanography, Pakistan	2012.4.2-2012.6.28
Waqar Ahmed	巴基斯坦国家海洋研究所 / National Institute of Oceanography, Pakistan	2012.4.2-2012.6.28
AsifInam	巴基斯坦国家海洋研究所 / National Institute of Oceanography, Pakistan	2012.7.6-2012.7.8
Monawwar Saleem	巴基斯坦国家海洋研究所 / National Institute of Oceanography, Pakistan	2012.7.6-2012.7.8
Nuzhat Khan	巴基斯坦国家海洋研究所 / National Institute of Oceanography, Pakistan	2012.7.6-2012.7.8
Ali Rashid Tabrez	巴基斯坦国家海洋研究所 / National Institute of Oceanography, Pakistan	2012.7.6-2012.7.8
Samina Kidwai	巴基斯坦国家海洋研究所 / National Institute of Oceanography, Pakistan	2012.8.4-2012.8.9
Ahsan Feroze	巴基斯坦科技部 / Ministry of Science and Technology, Pakistan	2012.7.6-2012.7.8
Norbert Hertkorn	德国环境健康研究中心 / German Research Center for Environmental Health, Germany	2012.10.22-11.18
Gerhard Kattner	德国阿尔弗雷德·魏格纳极地与海洋研究所 / Alfred Wegener Institute for Polar and Marine Research, Germany	2012.10.27-2012.11.2
Boris Koch	德国阿尔弗雷德·魏格纳极地与海洋研究所 / Alfred Wegener Institute for Polar and Marine Research, Germany	2012.10.27-2012.11.1
Venugopalan Ittekkot	德国不莱梅大学热带海洋生态研究中心 / Leibniz Center for Marine Tropical Ecology, University of Bremen, Germany	2012.3.5-2012.3.11
Petra Westhaus-Ekau	德国不来梅大学 / University of Bremen, Germany	2012.10.26
Vladimir Shuklin	俄罗斯自然科学院远东分支太平洋地理研究所 / Pacific Institute of Geography, Russian Academy of Sciences Far East Branch, Russia	2012.4.1-2012.4.8
Pavel Tishchenko	俄罗斯自然科学院远东分支太平洋地理研究所 / Pacific Institute of Geography, Russian Academy of Sciences Far East Branch, Russia	2012.4.1-2012.4.8
Frederic Melki	法国 Biotope 公司 / Biotope Company, France	2012.7.29
Anne-Liseughetto	法国 Biotope 公司 / Biotope Company, France	2012.7.29
Yujuan Liu	法国 Biotope 公司 / Biotope Company, France	2012.7.29
David Doxaran	法国皮埃尔与玛丽·居里大学 / University Pierre et Marie Curie Paris, France	2012.7.1-2012.7.3

专家 Visiting Scholar	单位 Affiliation	来访时间 Visiting Period
H.E.de Swart	荷兰乌特勒支大学 / Utrecht University, the Netherlands	2012.11.4-2012.11.9
Niels C. Alebregtse	荷兰乌特勒支大学 / Utrecht University, the Netherlands	2012.11.4-2012.11.9
Peter M.J. Herman	荷兰生态研究所 / Netherlands Institute of Ecology, the Netherlands	2012.10.27-2012.11.1
Zhigang Ma	荷兰皇家海洋研究所 / Royal Netherlands Institute for Sea Research, the Netherlands	2012.10.27-2012.11.4
Tom Ysebaert	荷兰皇家海洋研究所 / Royal Netherlands Institute for Sea Research, the Netherlands	2012.10.28-2012.11.1
Christian Schwarz	荷兰皇家海洋研究所 / Royal Netherlands Institute for Sea Research, the Netherlands	2012.4.10-2012.8.2 2012.10.27-2012.11.2
Su Zhongbo (Bob)	荷兰特温特大学 / University of Twente, the Netherlands	2012.10.28-2012.11.1
Dirk Van Maren	荷兰代尔夫特理工大学/ Delft University of Technology, the Netherlands	2012.10.28-2012.11.1
Cynthia Maan	荷兰代尔夫特理工大学/ Delft University of Technology, the Netherlands	2012.10.28-2012.11.2
Bram C. Van Prooijen	荷兰代尔夫特理工大学/ Delft University of Technology, the Netherlands	2012.10.26-2012.11.2
Steven te Slaa	荷兰代尔夫特理工大学/ Delft University of Technology, the Netherlands	2012.10.28-2012.11.2
Marcel J.F. Stive	荷兰代尔夫特理工大学/ Delft University of Technology, the Netherlands	2012.10.28-2012.11.2
Hubrecht Johannis De Vriend	荷兰代尔夫特理工大学/ Delft University of Technology, the Netherlands	2012. 10.28-2012.11.3
J.C. Winterwerp	荷兰代尔夫特理工大学/ Delft University of Technology, the Netherlands	2012.10.28-2012.11.3
Zhengbing Wang	荷兰代尔夫特理工大学/ Delft University of Technology, the Netherlands	2012.10.28-2012.11.1
Jan Adriaan Roelvink	荷兰的联合国教科文组织水教育学院 / UNESCO-IHE Institute for Water Education, the Netherlands	2012.10.22-2012.11.1
Birane Samb	联合国粮农组织 (FAO) 项目 / United Nations Food and Agriculture Organization, UN	2012.5.1-2012.5.6
William J. Mitsch	美国佛罗里达湾岸大学 / Florida Gulf Coast University, USA	2012.7.13-2012.7.17
Liming Chen	美国俄亥俄州立大学 / Ohio State University, USA	2012.7.19-2012.7.22
Warren A. Dick	美国俄亥俄州立大学 / Ohio State University, USA	2012.7.19-2012.7.22
Robert S. Prezant	美国蒙特克莱尔州立大学 / Montclair State University, USA	2012.5.4
Feng Huan	美国蒙特克莱尔州立大学 / Montclair State University, USA	2012.5.4
Willard S. Moore	美国南卡罗来纳大学 / University of South Carolina, USA	2012.3.1-2012.3.6 2012.5.3-2012.5. 8 2012.10.18-2012.11.6
E. Michael Perdue	美国波尔州立大学 / Ball State University, USA	2012.9.14-2012.9.17
Charles Arnold Brandt	美国西北太平洋国家实验室 / Pacific Northwest National Laboratory, USA	2012.10.28-2012.11.1
Zhaoqing Yang	美国西北太平洋国家实验室 / Pacific Northwest National Laboratory, USA	2012.4.23 2012.10.28-2012.11.1
Changsheng Chen	美国麻州大学 / University of Massachusetts, USA	2012.10.28-2012.11.5
Leonid Sokoletsky	美国环境保护署 / Environmental Protection Agency, USA	2012.5.22-2012.8.30

专家 Visiting Scholar	单位 Affiliation	来访时间 Visiting Period
Iris Anderson	美国威廉与玛丽学院 / College of William and Mary, USA	2012.5.28-2012.6.8
Zhanfei Liu	美国德克萨斯大学奥斯汀分校 / University of Texas at Austin, USA	2012.6.1
Jessica N. Fitzsimmons	美国麻省理工学院 / Massachusetts Institute of Technology, USA	2012.6.8-2012.6.17
Keqi Zhang	美国佛罗里达国际大学 / Florida International University, USA	2012.5.24-2012.6.12
Yanxia Ma	美国卡罗莱纳海岸大学 / Coastal Carolina University, USA	2012.6.19-6.21
Kehui Xu	美国卡罗莱纳海岸大学 / Coastal Carolina University, USA	2012.6.19-6.21
Xi Chen	美国康乃尔大学 / Cornell University, USA	2012.10.18
Hongzhou Xu	美国弗吉尼亚海洋研究院 / Virginia Institute of Marine Science, USA	2012.12.19-2012.12.26
Feng Hui	美国新罕布什尔大学 / University of New Hampshire, USA	2012.12.18
Changle Fang	美国 Rowe Technologies 公司 / Rowe Technologies, Inc., USA	2012.11.23
Xiongping Zhang	美国应用科学咨询公司 / Applied Science Associates, Inc., USA	2012.12.18
Wei Chen	美国盛沃利公司 / Worley Parsons Group, USA	2012.10.28-2012.10.31
Huang Jian	美国 Esri 公司 / Environmental System Research Institute, USA	2012.9.26
Zheng Chang	美国南卡罗来纳州州立大学 / South Carolina State University, USA	2012.12.9-2012.12.12
Fred H. Sklar	美国南佛罗里达水资源管理处 / South Florida Water Management District, USA	2012.7.13-2012.7.17
Bernhard Peucker-Ehrenbrin	美国伍兹霍尔海洋研究所 / Woods Hole Oceanographic Institution, USA	2012.10.27-2012.11.1
Francois Counillon	挪威国家能源研究科学计算中心 / National Energy Research Scientific Computing Center, Norway	2012.7.1-2012.7.4
RichardBellerby	挪威水研究研究所 / Norwegian Institute for Water Research, Norway	2012.10.28-2012.11.1
Eiji Matsumoto	日本名古屋大学 / Nagoya University, Japan	2012.5.15-2011.5.29
Yoshiki Saito	日本地质调查所 / Geological Survey of Japan, Japan	2012.5.31-2012.6.14
Tomoji Takamasa	日本东京海洋大学 / Tokyo University of Marine Science and Technology, Japan	2012.4.20
Xinyu Guo	日本爱瑗大学 / Ehime University, Japan	2012.3.5-2012.3.15 2012.10.16-2012.10.22
Timothy Ian Eglinton	瑞士苏黎世联邦理工学院 / Swiss Federal Institute of Technology Zurich, Switzerland	2012.10.27-2012.11.2
Christopher Craft	印第安纳大学 / Indiana University, India	2012.10.28-2012.11.2
Prabhakar V. Shirookar	印度国家海洋研究所 / National Institute of Oceanography, India	2012.5.21-2012.6.5
Fangxin Fang	英国帝国理工大学 / University of Imperial College, UK	2012.11.20
Jiansheng Xiang	英国帝国理工大学 / University of Imperial College, UK	2012.11.20
Lewis Le Vay	英国班戈大学 / University of Bangor, UK	2012.2.29
Tom Rippeth	英国班戈大学 / University of Bangor, UK	2012.2.29
Simon Philip Neill	英国班戈大学 / University of Bangor, UK	2012.10.27-2012.11.1
Colin Jago	英国班戈大学 / University of Bangor, UK	2012.2.29

专家 Visiting Scholar	单位 Affiliation	来访时间 Visiting Period
John A. Dearing	英国南安普顿大学 / University of Southampton, UK	2012.10.30-2012.11.4
Victor N. de Jonge	英国赫尔大学 / University of Hull, UK	2012.10.28-2012.11.1
Jeanette Rotchell	英国赫尔大学 / University of Hull, UK	2012.4.4-2012.4.23 2012.10.28-2012.10.31
Andrew J. Plater	英国利物浦大学 / University of Liverpool, UK	2012.10.27-2012.11.1
Ian Howard Townend	英国 HR Wallingford 有限公司 / HR Wallingford Limited, UK	2012.10.28-2012.11.1
Dapeng Yu	英国拉夫堡大学 / University of Loughborough, UK	2012.5.29
John Anderson	英国拉夫堡大学 / University of Loughborough, UK	2012.5.29
Zuqian Liu	台湾国立中山大学 / National Sun Yat-sen University, China	2012.11.28
Yongguan Zhu	中国科学院城市环境研究所 / Institute of Urban Environment, Chinese Academy of Sciences, China	2012.06.03
Shen Yu	中国科学院城市环境研究所 / Institute of Urban Environment, Chinese Academy of Sciences, China	2012.06.03
Donghao Li	延边大学 / Yanbian University, China	2012.06.06
Qixing Zhou	南开大学 / Nankai University, China	2012.06.08
Lin Wang	珠江水利科学研究院 / Research Center on Pearl River Estuary & Coast Ministry of Water Resources, China	2012.06.18
Fengyi Tan	香港城市大学 / City University of Hong Kong, China	2012.5.10
Liping Guan	香港城市大学 / City University of Hong Kong, China	2012.5.10
Jincheng Shan	香港城市大学 / City University of Hong Kong, China	2012.5.10
Zhaojian Zhang	香港城市大学 / City University of Hong Kong, China	2012.5.10
Daniele Perissin	香港中文大学 / Chinese University of Hong Kong, China	2012.2.19-2012.2.24
Jianrong Cao	国家海洋局第一海洋研究所 / First Institute of Oceanography, State Oceanic Administration, China	2012.10.28-2012.10.31
Guangquan Chen	国家海洋局第一海洋研究所 / First Institute of Oceanography, State Oceanic Administration, China	2012.10.28-2012.10.31
Xianwei Meng	国家海洋局第一海洋研究所 / First Institute of Oceanography, State Oceanic Administration, China	2012.10.28-2012.10.31
Peng Xia	国家海洋局第一海洋研究所 / First Institute of Oceanography, State Oceanic Administration, China	2012.10.28-2012.10.31
Xingyong Xu	国家海洋局第一海洋研究所 / First Institute of Oceanography, State Oceanic Administration, China	2012.10.28-2012.10.31
Yunlong Chen	中国海洋大学 / Ocean University of China, China	2012.10.28-2012.10.31
Bin Chen	中国海洋大学 / Ocean University of China, China	2012.10.28-2012.10.31
Anlong Li	中国海洋大学 / Ocean University of China, China	2012.10.28-2012.10.31
Houjie Wang	中国海洋大学 / Ocean University of China, China	2012.10.28-2012.10.31
Xilin Zhang	中国海洋大学 / Ocean University of China, China	2012.10.28-2012.10.31

专家 Visiting Scholar	单位 Affiliation	来访时间 Visiting Period
Guoling Zhang	中国海洋大学 / Ocean University of China	2012.10.28-2012.10.31
Zhiyou Jing	中国科学院南海海洋研究所 / South China Sea Institute of Oceanology, Chinese Academy of Sciences, China	2012.10.28-2012.10.31
Lingyan Sun	中国科学院南海海洋研究所 / South China Sea Institute of Oceanology, Chinese Academy of Sciences, China	2012.10.28-2012.10.31
Weihua Zhou	中国科学院南海海洋研究所 / South China Sea Institute of Oceanology, Chinese Academy of Sciences, China	2012.10.28-2012.10.31
Sumin Liu	中国科学院南海海洋研究所 / South China Sea Institute of Oceanology, Chinese Academy of Sciences, China	2012.10.28-2012.10.31
Hongwei Xiao	中国科学院南海海洋研究所 / South China Sea Institute of Oceanology, Chinese Academy of Sciences, China	2012.10.28-2012.10.31
Dingtian Yang	中国科学院南海海洋研究所 / South China Sea Institute of Oceanology, Chinese Academy of Sciences, China	2012.10.28-2012.10.31
Xiujuan Shan	中国水产研究院黄海分局 / Yellow Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences, China	2012.10.28-2012.10.31
Ruijing Wan	中国水产研究院黄海分局 / Yellow Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences, China	2012.10.28-2012.10.31
Yiping Ying	中国水产研究院黄海分局 / Yellow Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences, China	2012.10.28-2012.10.31
Xiaodong Bian	中国水产研究院黄海分局 / Yellow Sea Fisheries Research Institute, Chinese Academy of Fishery Sciences, China	2012.10.28-2012.10.31
Chaoyu Yang	国家海洋局南海分局 / South China Sea branch, State Oceanic Administration, China	2012.10.28-2012.10.31
Kedong Yin	中山大学 / Sun Yat-Sen University, China	2012.10.28-2012.10.31
Zhigang Lai	中山大学 / Sun Yat-Sen University, China	2012.10.28-2012.10.31
Jianjun Zhou	清华大学 / Tsinghua University, China	2012.10.28-2012.10.31
Binliang Lin	清华大学 / Tsinghua University , China	2012.10.28-2012.10.31

邀请报告与大会报告

Invited & Keynote Presentations at International Conferences

2012 年实验室有 50 余人次参加国际学术会议并进行学术交流，其中特邀报告 5 次，大会报告 6 次。
Members of SKLEC attended international conferences for more than 50 person-times, including 5 invited talks and 6 plenary lectures.

Invited Talks:

Chen Zhongyuan, Asia megadelta: Holocene environmental evolution and future perspectives, Magellan+Workshop, Bay of Bengal Drilling, Oct. 8-11, 2012, Bremen

Chen Zhongyuan, Impact of the Three-Gorges dam on the middle and lower Yangtze basin: Sediment transport and river channel erosion - what we can learn? International Symposium of Impact of Three-Gorges Dam, May13-14, 2012, Berkeley

Yang Shilun, 1. Sedimentation in the Three Gorges Reservoir; 2. Estuarine and coastal sedimentary and morphologic responses to the construction of Three Gorges Dam, After Three Gorges Dam: What have we learned? May13-14, 2012, Berkeley

Zhang Jing, Advances in Observation and Modelling of Biogeochemical and Oxygen Dynamics in the Ocean, On the seasonal hypoxia off the Changjiang Estuary and in the East China Sea, Jun.17-18, 2012, Kiel

Hu Liuming, Ocean-climate interactions at regional level: An opportunity for CLIVAR-IMBER cooperation, The 12th Annual Meeting of the Asian-Australian Monsoon Panel, Sep. 13-14, 2012, Nanjing

Plenary Speeches:

Chen Zhongyuan, Sediment delivery and eco-health of mega-estuaries: Comparing the Yangtze and the Nile Rivers, ECSA 50th and Coastal, Estuarine and Shelf Sciences, Sep. 3-7, 2012, Venice

Zhu Jianrong, Impact of sea level rise on saltwater intrusion in the Changjiang River Estuary, International Symposium on Climate Change and Human Activities: Coastal Consequences and Responses, Oct. 29-31, 2012, Shanghai

Zhang Weiguo, Yangtze Delta evolution: Influence of climate change and human activities, International Symposium on Climate change and Human Activities: Coastal Consequences and Responses, Oct. 29-31, 2012, Shanghai

Shen Fang, GOCI observations for sediment dynamics in the Yangtze Estuary, (GOCI)PI workshop, Jan. 11-12, 2012, South Korea

Ge Zhenming, Impacts of climate change and human activities on carbon budget in coastal wetland ecosystem, International Symposium on Climate Change and Human Activities: Coastal Consequences and Responses, Oct. 29-31, 2012, Shanghai

Ge Zhenming, Modeling assessment and sustainable management of regional C sink/source under expected climate change, Annual USCCC Meeting, Jun. 15-18, 2012, Changsha

开放基金
SKLEC Research Fund

2012 年，实验室在研开放基金 15 项，共 90 万元，新增开放基金 13 项，共 54 万元。
There were 15 on-going projects funded by SKLEC with a total of 0.9 million RMB in 2012, and 13 new projects amounted to 0.54 million RMB.

2012 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 2012

姓名 Name	课题名称 Title	单位 Affiliation
刘红 Liu Hong	长江口深水航道泥沙混合特征及来源指示 Mixed source of sediment in deep-water channel in the Yangtze Estuary and its source ascription	中交上海航道勘察设计研究院有限公司 Shanghai Waterway Engineering Design and Consulting Co., Ltd.
蒋陈娟 Jiang Chenjuan	北槽水沙过程对深水航道工程的响应 Response of water and sediment transportation process in north passage of the Yangtze River Estuary to deep water channel project	扬州大学 Yangzhou University
唐政洪 Zhenghong Tang	Examining local climate adaptation/action planning capacity for coastal zone vulnerability: A comparison study of the Houston-Galveston Bay area in U.S. and the Yangtze River Estuary in China	内布拉斯加 - 林肯大学 University of Nebraska – Lincoln, USA
陈小英 Chen Xiaoying	近百年来黄河三角洲海岸演变对黄河尾闾摆动的响应 Response of the Yellow River deltaic coast evolution to the shift of lower reaches of Yellow River in the last 100 years	青岛海洋地质研究所 Qingdao Institute of Marine Geology
胡忠行 Hu Zhongxing	浙江瓯江泥沙表征及其对东海陆架沉积物源的示踪意义 Character of sediment in Oujiang River, Zhejiang Province and implication for sediment source tracing in the East China Sea Shelf	浙江师范大学 Zhejiang Normal University
蔡炜颖 Cai Weiying	南海黑角珊瑚的高分辨环境记录与全球变化 High resolution environmental record revealed by Amtipathes dichotoma in the South China Sea and implications for global change study	华东师范大学 East China Normal University
胡莹莹 Hu Yingying	季节性缺氧对辽河口浅水沉积物内源磷释放的影响研究 Effect of seasonal hypoxia on phosphorus release in shallow water sediments of Liaohe Estuary	国家海洋环境监测中心 Environmental Monitoring Center, State Oceanic Administration
方涛 Fang Tao	灌河口海域浮游植物生长的营养盐限制研究 Nutrient limitation on phytoplankton growth in Guanhe River Estuary	淮海工学院 Huaihai Institute of Technology
黄华梅 Huang Huamei	基于海洋疏浚泥底质的河口海岸湿地生态修复研究 Ecological restoration of coastal and marine wetland using marine dredging mud sediment	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
李行 Li Xing	流域重大工程影响下的长江三角洲岸线系统行为研究 Response of shoreline system behavior of the Yangtze River delta to river basin engineering projects	江苏师范大学 Jiangsu Normal University
黄瑶 Huang Yao	底播 IMTA 系统中碳氮生源要素的转移和输运规律研究 Study on transfer and transport of biogenic elements carbon and nitrogen in bottom sowing IMTA system	中国水产科学研究院黄海水产研究所 Yellow Sea Fisheries Research Institute of Chinese Academy of Fishery Sciences
David Doxaran	Vertical dynamics of terrestrial suspended particulate matter in the East China Sea (VD-SPM)	法国国家科学研究中心 Villefranche 海洋实验室 Laboratoire d'Océanographie de Villefranche of the French National Center for Scientific Research, France
Johnny Johannessen	Satellite born SAR based shallow water bathymetry estimation (SARbath)	挪威 Nansen 环境遥感中心、挪威卑尔根大学 Nansen Environmental and Remote Sensing Center, Norway University of Bergen, Norway

研究进展
Research Highlights

2012 年，实验室在河口研究方面，围绕长江口和珠江口盐水入侵的动力因素、沿江引水对河口水量的影响、三峡工程对河流 - 河口 - 三角洲沉积物的粒度影响、洞庭湖和长江三角洲环境演变对新石器文化的影响、气候及人类活动对珠江水沙输送的影响等主题开展了深入研究；在海岸研究方面，围绕 FVCOM 数值模型的丁坝 - 导堤模拟算法、波 - 流联合作用下潮滩湿地的侵蚀 / 淤积、近海悬沙时空分布及人类活动的影响、长江三角洲全新世海平面和淡水流量变化重建的地球化学方法、苏北潮滩物源、格陵兰岛周边海域近 1200 年的环境变化等方面开展了深入研究；在生态环境方面，围绕沉积物和水界面的硝酸盐转换、放射性核素的国际比对工作、福岛核事故后放射性核素的检测、镭同位素技术应用和地下水检测、长江口植被的扩张和水动力间的相互作用、温度与 CO_2 升高及不同水位下芦苇生物量生长和光合作用适应的测定与模拟、长江口根茎植物的克隆分工等开展了深入研究。

In 2012, in the field of estuarine study, the following topics were focused on: dynamic mechanism of saltwater intrusion in the Yangtze Estuary and Pearl River Estuary, the impact of water diversion along the river on water discharge to the estuary, the impact of the Three Gorges Dam on the texture of sediments along the Yangtze River and its estuary and delta, the impact of environmental change on Neolithic culture in the Dongting Lake area and the Yangtze Delta, the impact of climate change and human activities on water and sediment delivery in the Pearl River. In the field of coastal study, the topics were: a dike–groyne algorithm in a terrain-following coordinate ocean model (FVCOM), accretion and erosion of tidal flat under combined current-wave stress, spatial, temporal and human-induced variations in suspended sediment concentration in the adjacent coastal areas of the Yangtze Estuary, geochemical method for Holocene sea level and freshwater discharge reconstruction in the Yangtze delta, sediment sources in tidal flat deposits in northern Jiangsu Plain and environmental changes in the sea near Greenland during the last 1200 years. In the field of ecological and environmental study, the following areas are focused on: transformation of nitrate near the sediment–water interface,, international calibration of radionuclide activities determination, detection of gamma emitting nuclides in radioaerosol samples after Fukushima accident, application of radium isotopes and detection of submarine groundwater discharge (SGD), interactions between the range expansion of saltmarsh vegetation and hydrodynamic regimes in the Yangtze River Estuary, measured and modeled biomass growth in relation to photosynthesis acclimation of a bioenergy crop under elevated temperature, CO_2 enrichment and different water regimes, and division of labor in rhizomatous species in the Yangtze River Estuary.

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。实验室受长江航道管理局委托，研究流域来水来沙变化对长江口三角洲演变及汊道稳定性影响；受国家海洋局北海预报中心委托，设计微波散射计数据业务化海洋应用技术流程；受上海市绿化和市容管理局委托，对上海市湿地 GIS 管理系统进行更新和维护；受上海市地质调查研究院委托，研究长江三角洲第四纪沉积地貌环境演变；受交通运输部环境保护中心委托，进行武汉市四环线项目大桥段溢油和可溶化学品输运扩散数值模拟；受上海城投原水有限公司青草沙水库管理分公司委托，对长江河口青草沙水库取水口外水域盐水入侵、水文条件进行测试等。

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 Yangtze Estuary Waterway Administration Bureau, the impact of fluvial water and sediment transport on the Yangtze Estuary Delta evolution and branch stream stability were studied. Funded by North China Sea Marine Forecasting Center of State Oceanic Administration, the working flowchart of microwave scattering meter application was designed. Funded by Shanghai Greenery and Public Sanitation Bureau, GIS management system for Shanghai wetland was updated and maintained. Commissioned by Shanghai Institute of Geological Survey, Quaternary sedimentary landform and environment evolution of the Yangtze Delta was studied. Commissioned by Environment Protection Center of Ministry of Transport of China, numerical simulation was carried out for oil spill and dissolved chemicals diffusion in the river of Wuhan. Commissioned by Shanghai Chengtou Raw Water Co., Ltd., saltwater intrusion in water area near the reservoir were monitored and analysed.

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

Impacts of wind stress on saltwater intrusion in the Yangtze Estuary

Li, L., Zhu, J.R., Wu, H., ***Science China-Earth Sciences***, 2012, 55 (7): 1178-1192.

The observation at the Chongxi gauging station indicated the salinity of saltwater spilling over from the North Branch to the South Branch increased abnormally from November 10 to 12 in 2009 (during neap tide) and from February 11 to 12 in 2010 (during moderate tide). We found for the first time that the strong northerly wind was responsible for the above abnormal salinity increase. Previous studies indicated that the saltwater intrusion in the Yangtze Estuary is influenced mainly by the river discharge, the tide, and the wind stress, but the impacts of variations of wind speed and direction on it have not been investigated. In this study the impacts of wind stress on the saltwater intrusion were numerically simulated and the associated mechanisms were analyzed. The model results were consistent with the observed data obtained at six gauging stations during February and March in 2007 and four gauging stations in March 2008, and the abnormal salinity risings were well captured. Meanwhile, if the wind speed is reduced by half, the salinity there will be significantly decreased. Driven by the monthly mean river discharge of 11000 m^3/s and northerly wind of 5 m/s from January to February, the model simulated the temporal and spatial variation of saltwater intrusion. The wind-driven circulation, as well as the net water and salt fluxes from the North Branch into the South Branch, was calculated and analyzed in the cases of different wind speeds and directions. The results indicated that the intensity of the saltwater intrusion in the Yangtze Estuary is significantly influenced by the wind speeds and directions.

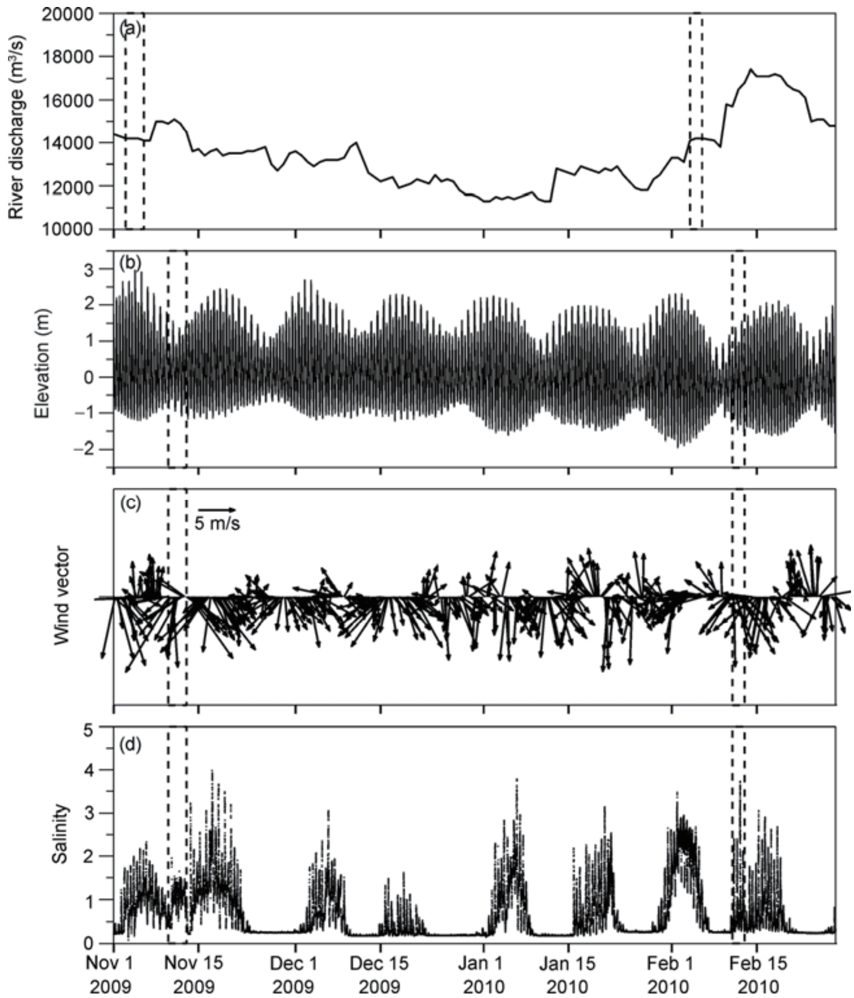


Fig. 2. *In situ* data measured from November 2009 to February 2010. (a) River discharge at Datong gauging station; (b) tidal level at Qinglonggang station; (c) wind vector at the weather station in the eastern Chongming Sandbank; (d) surface salinity at Chongxi station. The black dashed boxes in (b) (d) denote the periods from November 10 to 12 in 2009 and from February 11 to 12 in 2010, respectively. Dashed boxes in (a) indicate the periods 7 days before that shown in (b) (d).

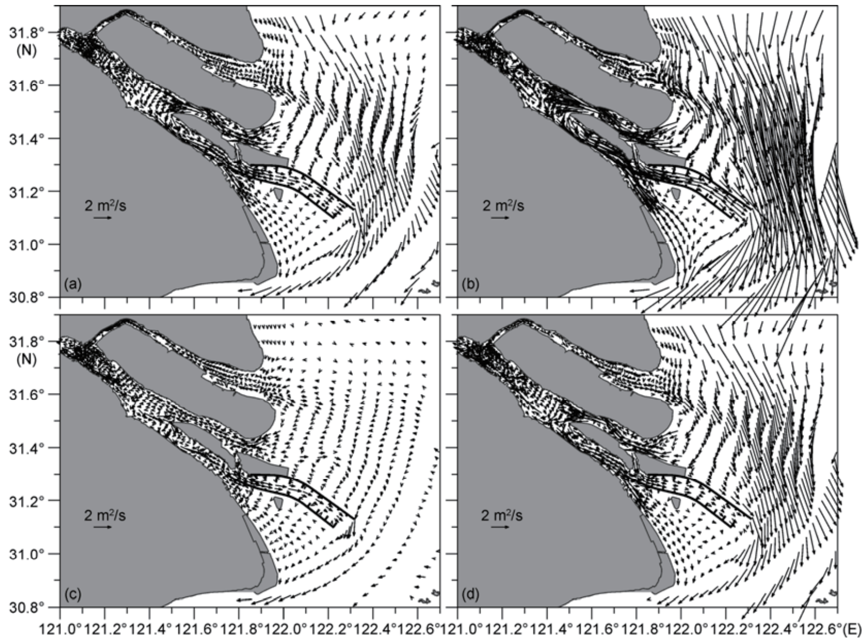


Fig. 14. Pure wind-driven NUWF under the northerly wind of 5 m/s (a), northerly wind of 10 m/s (b), northeasterly wind of 5 m/s (c) and northwesterly wind of 5 m/s (d).

An analytical solution for tidal propagation in the Yangtze Estuary, China

Zhang, E.F., Savenije, H.H.G., Chen, S.L., Mao, X.H., ***Hydrology and Earth System Sciences***, 2012, 16: 3327-3339.

An analytical model for tidal dynamics has been applied to the Yangtze Estuary for the first time, to describe the tidal propagation in this large and typically branched estuary with three-order branches and four outlets to the sea. This study shows that the analytical model developed for a single-channel estuary can also accurately describe the

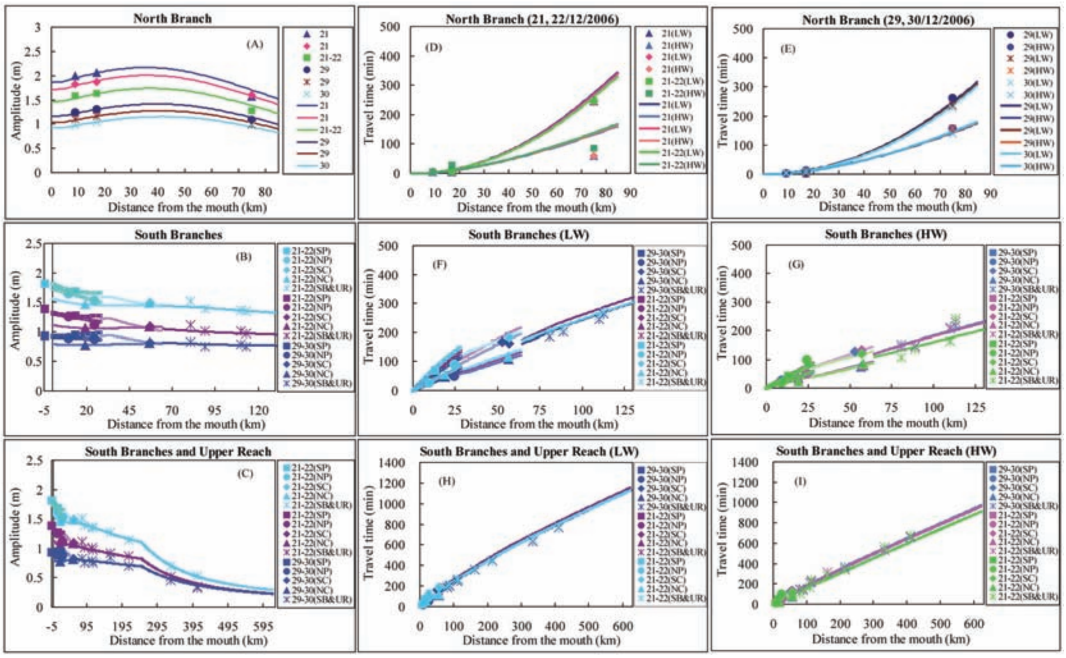


Fig. 3. Computed results (drawn lines) for the tidal amplitude (A–C) and travel time (D–I) along the Yangtze Estuary on 21–22, 29– 30 December 2006, compared to measurements (symbols).

tidal dynamics in a branched estuary, particularly in the downstream part. Within the same estuary system, the North Branch and the South Branches have a distinct tidal behaviour: the former being amplified demonstrating a marine character and the latter being damped with a riverine character. The satisfactory results for the South Channel and the South Branch using both separate and combined topographies confirm that the branched estuary system functions as an entity. To further test these results, it is suggested to collect more accurate and dense bathymetric and tidal information.

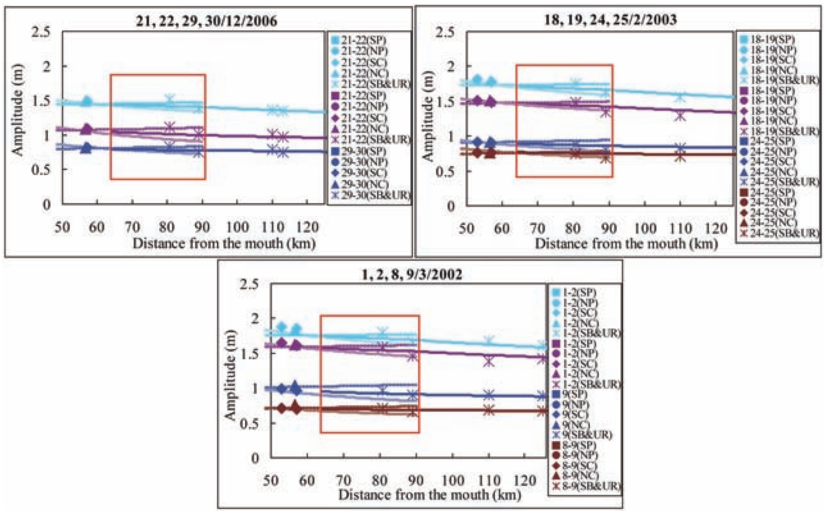


Fig. 7. Computed tidal amplitude for the South Branch after the junction of the North Channel and the South Channel (64 km) until 90 km (inside the rectangle frame), using separate topography of these two channels.

Impacts of deep waterway project on morphological change within the north passage of the Changjiang Estuary, China.

Pan, L.Z., Ding, P.X., Ge, J.Z., ***Journal of Coastal Research***, 2012, 28(5): 1165-1176.

Over the past decade, three phases of the Deep Waterway Project (DWP) have been carried out to deepen the shipping channel of the Changjiang Estuary, where a significant sandbar previously dominated. This project has produced significant hydrodynamic and morphological changes within the North Passage of the Changjiang Estuary. High-resolution and continuous seasonal bathymetric data from 1998 to 2008 provide good insight into sedimentation processes. These data reveal several significant characteristics: (1) During phaseI, strong erosion occurred around the upper region, and the entrance, middle, and lower regions are under moderatede position. The groin-blocked region had strong depositions. (2) The main-channel region shifted to erosion-dominant conditions during phaseII. Erosion also occurred in the northern areas of the upper and middle regions. The entrance and southern areas of the upper and middle regions experienced deposition. (3) During phaseIII, the entrance region reached sedimentation equilibrium, and the northern area of the lower region experienced strong erosion. The southern areas of the middle and lower regions were under deposition. Domain-nesting Delft3D-flow model is applied to understand the mechanisms of the observed morphology and its changes induced by three phases of the DWP, which reveals that hydrodynamics intensify within the main-channel regions and decrease in the groin-blocked regions. These results are consistent with sedimentation patterns found. The simulations also show that dikes effectively keep the high suspended sediment concentration waters of Jiuduansha Shoal from entering the North Passage.

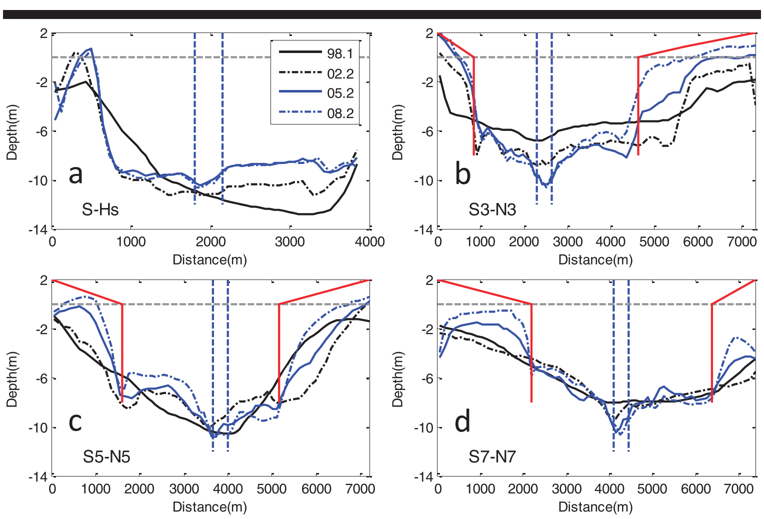


Fig.5.Depth changes from January 1998 to February 2008 at four cross-channel sections in the North Passage. (Color for this figure is only available in the online version of this paper.)

Spatial and temporal variations in grain size of surface sediments in the littoral area of Yellow River Delta.
Ren, R.X.Z., Chen, S.L., Dong, P., Liu, F., ***Journal of Coastal Research***, 2012, 28(1A): 44-53.

The impacts of human activities on the sediment load of the Yellow River and the long-term evolution of the delta have been extensively investigated, but less is known of the variation in sediment grain size in the littoral zone. In this study, the data of surface sediment samples collected from the littoral area of the Yellow River Delta in 2000 and 2007 are used to investigate the spatial distribution and transport pathway of the sediment, as well as the grain size response to the drastic decrease in riverine sediment discharge. By applying the geostatistics analysis method to grain size parameters in determining the characteristic distance in the sediment trend analysis method, an effective way to understand the movement and gradation of surface sediments around the delta has been proposed. The results show that as a whole the sediment in the inshore erosion area is coarser than that in the offshore accretion area. The grain size trends obtained reveal two converging zones of sediment movement. We find a coarsening trend in sediment from 2000 to 2007. Possible mechanisms for this trend are discussed.

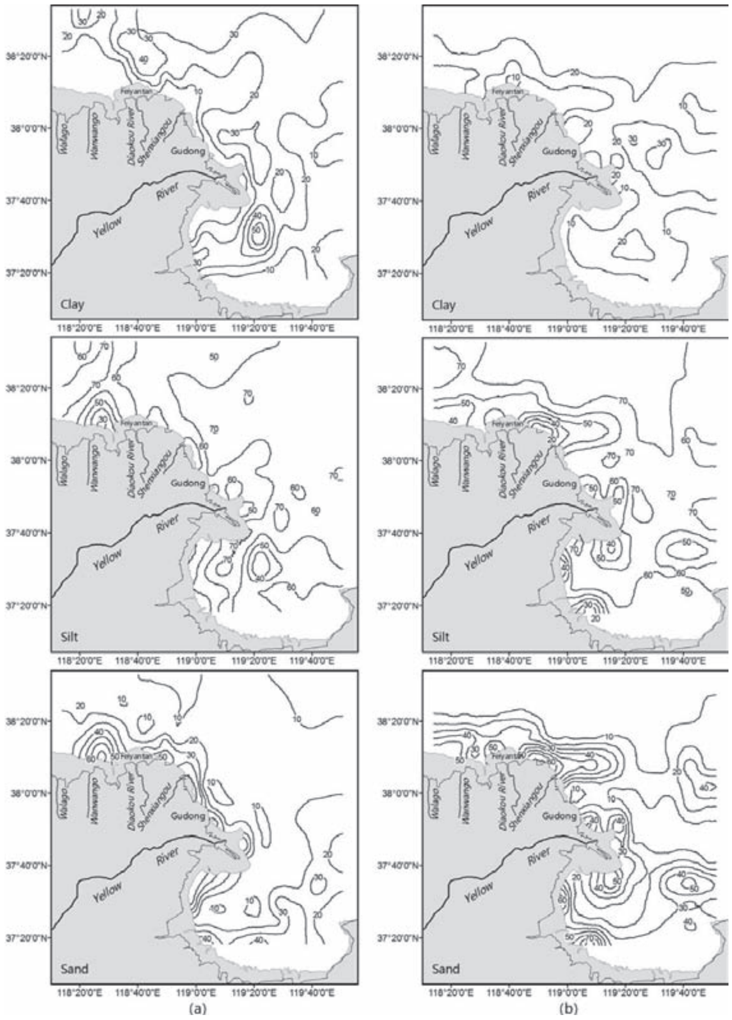


Fig. 5. Distributions of clay, silt and sand, (a) 2000 data; (b) 2007 data.

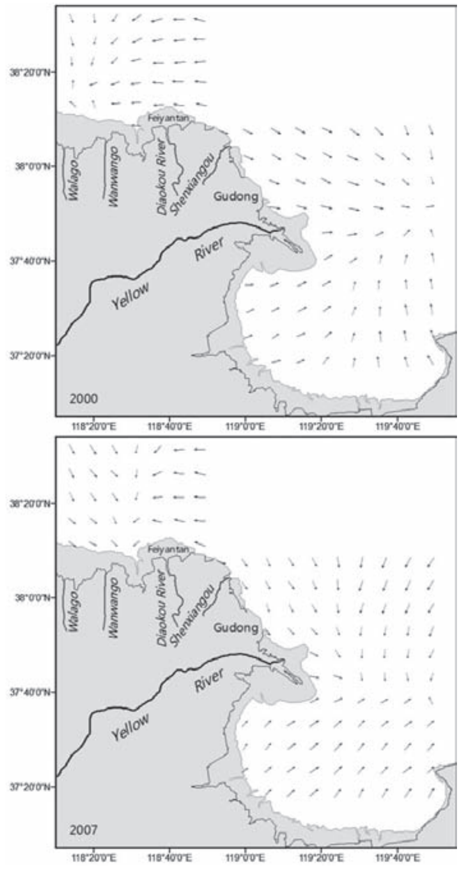


Fig. 8. Grain size trend patterns.

Dynamics of saltwater intrustion in the Modaomen Waterway of the Pearl River Estuary

Wang, B., Zhu, J.R., Wu, H., Yu, F.J., Song, X.J., ***Science China-Earth Sciences***, 2012, 55 (11): 1901-1918.

Observations indicate an abnormal characteristic of saltwater intrusion in the upper Modaomen Waterway of the Pearl River Estuary, i.e., the maximum salinity occurs during the neap tide or the coming moderate tide instead of during the spring tide. To explore the associated dynamic mechanisms, a high resolution three-dimensional numerical model was set up based on the Finite Volume Coastal Ocean Model (FVCOM), which covered the entire river network, the Pearl River Estuary, and the adjacent sea. Numerical experiments illustrated that the upper Modaomen Waterway is significantly influenced by the saltwater intrusion from the Hongwan Waterway, a narrow and shallow channel connecting the Modaomen Waterway to the sea. Specific topography, spring-neap tidal variation, local wind stress, and their interaction drive an up-estuary residual current in the Hongwan Waterway, which is much stronger during the neap tide than during the spring tide. As a result, more saltwater in the Hongwan Waterway is spilled over into the Modaomen Waterway during the neap tide or the coming moderate tide. This is the inherent dynamic mechanism why the saltwater intrusion in the upper Modaomen Waterway reaches its maximum during the neap tide or the coming moderate tide. Besides, we also found that the winter prevailing wind can pronouncedly enhance the saltwater intrusion in the Modaomen Waterway.

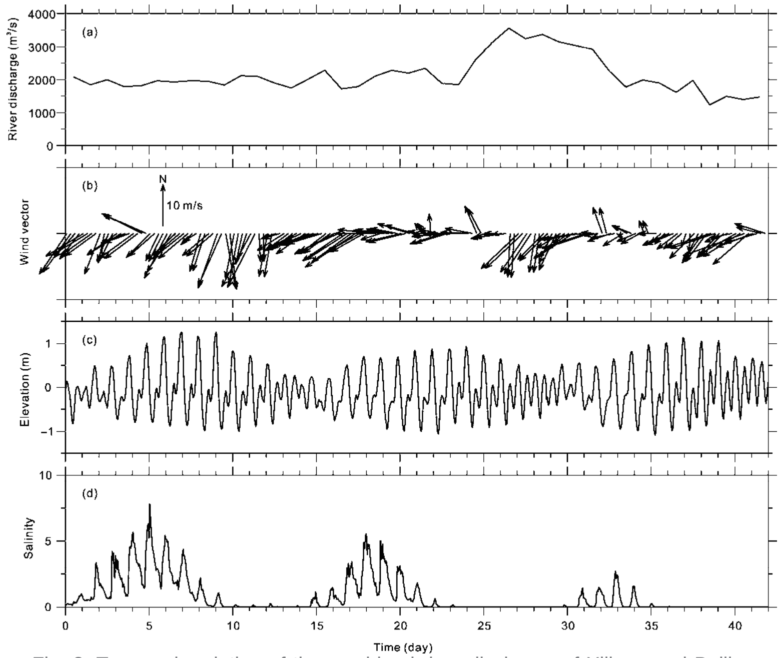


Fig. 2. Temporal variation of the combined river discharge of Xijiang and Beijiang River (a), wind vector at S2 station (b), tidal level at Denglongshan gauging station (c), and depth-averaged salinity at Pinggang station (d) from 4 January to 14 February in 2005.

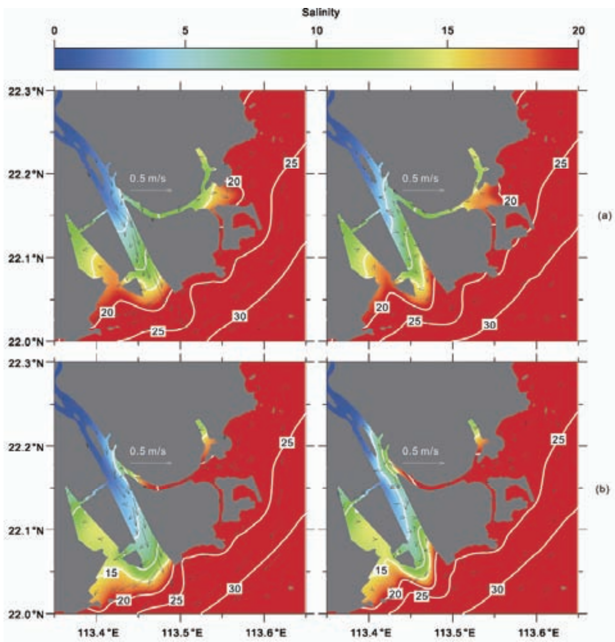


Fig. 10. Tidal-averaged salinity and current distribution at the surface layer (left panels) and bottom layer (right panels) during the spring (a) and neap (b) tides (salinity contour interval is 5).

The impact of the Three Gorges Dam on the downstream distribution and texture of sediments along the middle and lower Yangtze River (Changjiang) and its estuary, and subsequent sediment dispersal in the East China Sea

Luo, X.X., Yang, S.L., Zhang, J., ***Geomorphology***, 2012, 179: 126-140.

The grain size of river sediments changes systematically downstream from source to sink, and is influenced by catchment lithology, geomorphology, hydrology, oceanography and, in modern settings, anthropogenic impacts. Compared with small, gravel-bedded river systems, less is known about large, sandy-bed rivers, particularly from the river source to marine sink. In the present study, we examine longitudinal changes in sediment grain size along the middle and lower Yangtze River, downstream of the Three Gorges Dam (TGD), and along the major sediment dispersal pathway into the East China Sea, over a total length of 2100 km. We also examine the spatial patterns of seabed sediment grain size in the East China Sea adjacent to the Yangtze Estuary (70,000 km^2 in area). In particular, we consider the impact of the TGD on the grain size of the riverbed and seabed sediments. Before the construction of the TGD, the relationship between median grain size and distance along the sandy bed of the middle and lower Yangtze showed a downstream fining trend that was exponential in form. After the TGD was built, erosion caused an abrupt gravel–sand transition to develop in the section immediately downstream of the TGD. In the Yangtze Estuary, flocculation and subsequent deposition of suspended riverine mud during the slack water period between flood and ebb tides led to the formation of an abrupt sand–mud transition. Muddy deposits along the major long shore sediment dispersal route also show an exponential fining trend. However, towards the open East China Sea, the modern riverine muds are replaced seawards by older sands. The mud margin there was found to have retreated landward significantly over the post-TGD period due to erosion driven by the significant decrease in sediment supply from the Yangtze River. We expect that the impact of the TGD on the grain size of bed sediments in the Yangtze River and the East China Sea will continue for some time, and the change in the grain size of bed sediments there will become more pronounced.

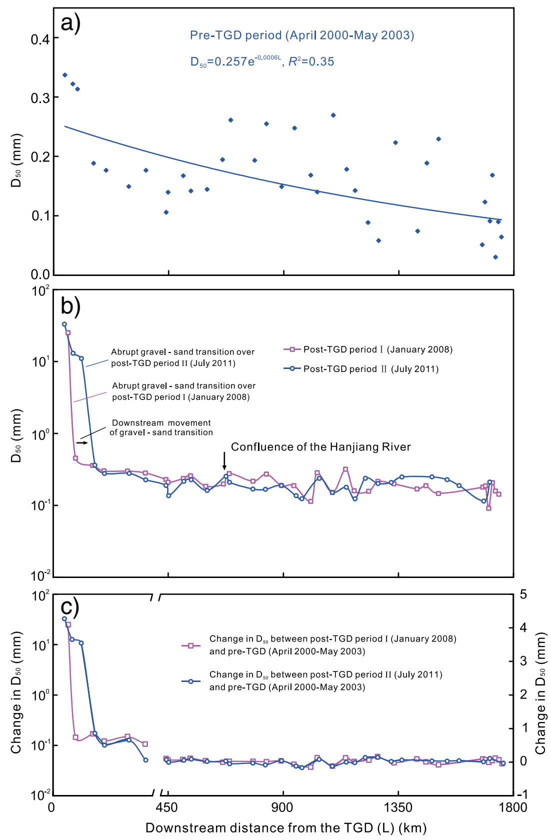


Fig. 2. (a) D_{50} values of bed sediments along the middle and lower Yangtze River, and the correlation between downstream distance and D_{50} over the pre-TGD period. (b) D_{50} values of bed sediments along the middle and lower Yangtze River over the two post-TGD periods with the abrupt gravel–sand transition indicated. (c) Changes in D_{50} from the pre- to post-TGD period along the middle and lower Yangtze River. All values represent a cross-channel sectional average of (typically) three samples.

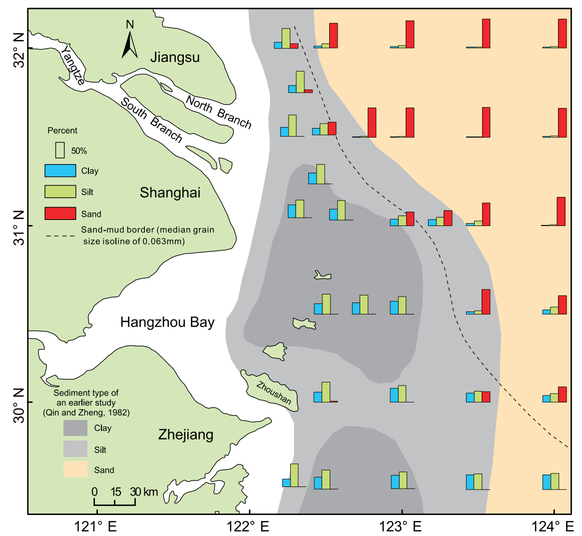


Fig. 6. The sand–mud boundary in the East China Sea (determined by interpolation) for post-TGD period I (2008), and histograms of sediment composition from post-TGD period I (2008), and also from Qin and Zheng (1982)

Early mid-Holocene sea-level change and coastal environmental response on the southern Yangtze delta plain, China: implications for the rise of Neolithic culture

Wang, Z.H., Zhuang C.C., Saito, Y., Chen, J., Zhan, Q., Wang, X.D., ***Quaternary Science Reviews***, 2012, 35: 51-62.

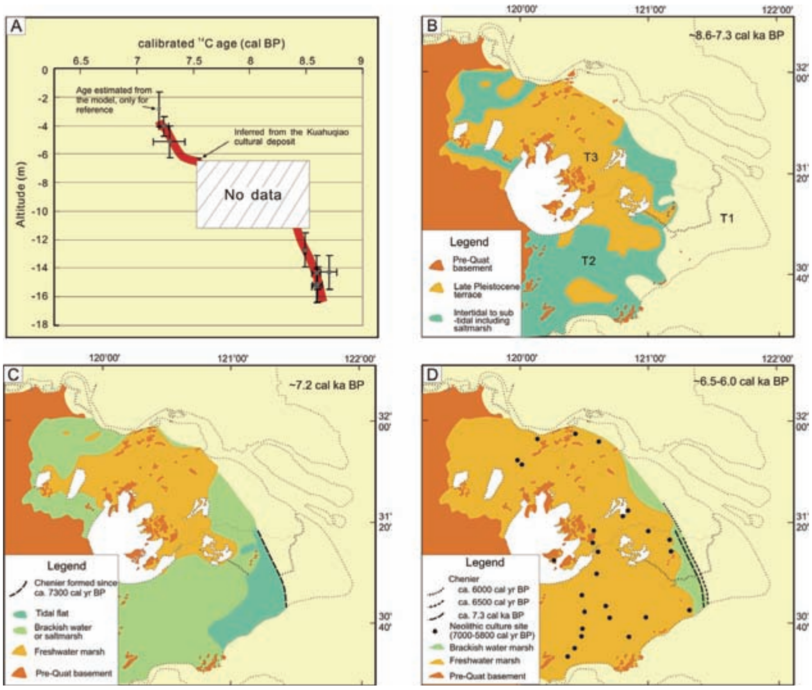


Fig. 8. Reconstructed sea-level curve and evolution of the Taihu Plain from ca 8600 to 6000 cal BP. A: Sea-level curve for the southern Yangtze delta from 8700 to 7200 cal BP (detailed data provided in Table 2). B: Distribution of subtidal to intertidal zone including saltmarsh during ca 8600e7600 cal BP. The late Pleistocene terraces at ca 5 m depth are also shown. C: Freshwater, brackish water or saltmarsh, tidal flat, and chenier ridge at ca 7300 cal BP. D: Freshwater/brackish water marsh and chenier ridges at ca 6500e6000 cal BP

We used a series of Holocene sediment cores with AMS ^{14}C dated basal saltmarsh peat and supratidal sediment to reconstruct early mid-Holocene sea-level change on the southern Yangtze delta plain. We also synthesized results for ca 150 late Quaternary cores, as well as archeological data to reveal the unique interplay between coastal evolution and Neolithic cultural response. Relative sea level was ca -16.5 to -14.5 m from 8600 to 8500 cal BP and ca -6 to -4 m from 7400 to 7200 cal BP, reflecting the rate of eustatic sea-level rise but being ca 10 m higher possibly because of the effect of hydroistostasy. Three late Pleistocene interfluve terraces, T3 to T1, were revealed at burial depths of <5 m, 5-15 m, and 20-30 m, respectively, lying between the paleo-incised mega-valleys of the Yangtze River in the north and the Qiantang River in the south, during the last glacial maximum. During the early mid-Holocene, the combined effect of rapid sea-level rise and the huge sediment accommodation space of the mouths of the two mega-rivers resulted in widespread inundation by brackish water and the shoreline retreated onto the highest terrace (T3). Although seaward migration of the Yangtze delta probably began at ca 7300 cal BP, saltmarsh and tidal flats dominated on the southern Yangtze delta plain until ca 6500 to 6000 cal BP when sea level became relatively stable and the shoreline prograded rapidly from T3 to the seaward boundary of T2. The concurrent formation of the freshwater-dominated Taihu Plain allowed Neolithic settlement and development of agriculture.

Migration of Neolithic settlements in the Dongting Lake area of the middle Yangtze River basin, China: Lake-level and monsoon climate responses

Liu, T., Chen, Z.Y., Qianli Sun, Q.L., Finlayson, B., ***The Holocene***, 2012, 22(6): 649-657.

The vast Dongting Lake in the middle Yangtze River basin, China, was occupied by Chinese Neolithic settlements starting 10 000 years ago, and rice cultivation there is probably the earliest in the world. The numerous Neolithic settlements identified by previous archaeological surveys represent the five major Neolithic cultural stages, i.e. the Pengtoushan (9000–7900 cal. yr BP), Zaoshixiaceng (7900–6800 cal. yr BP), Daxi (6800–5500 cal. yr BP), Qujialing (5500–5000 cal. yr BP), and Shijiahe (5000–4000 cal. yr BP). Using sedimentological and geoarchaeological approaches, this paper analyses the drivers of basin-scale settlement relocation in relation to lake-level fluctuations and monsoon climate variations in the Holocene. The relocation of Neolithic sites around the lake shoreline and on the adjacent floodplain, together with radiocarbon-dated stratigraphy, clearly indicates that the shape of the lake basin was an incised and elongated valley occupied by a lake in the early Holocene, which became a broader and shallower depression in the mid to late Holocene. The established lowest habitable base of the settlements positioned on the lake shore assists reconstruction of the change in lake level from 22 m at 9000 cal. yr BP to 26 m at 5500–4000 cal. yr BP, although higher and lower lake levels occurred during the intervening cultural stages. The pollen spectra reveal a warming trend throughout the Holocene with at least four major temperature cycles, driven by monsoon variations between temperateand warm-humid conditions. In the early Holocene the climate changed from cool-dry to warm-humid, and this played a key role in developing the earliest Pengtoushan culture in the region. Subsequent climate fluctuations fit well with the advance and retreat of the lake shore, also coevally with Neolithic site movements in the lake region. In this study we show how geoarchaeological evidence can be used in environmental reconstruction during the Holocene.

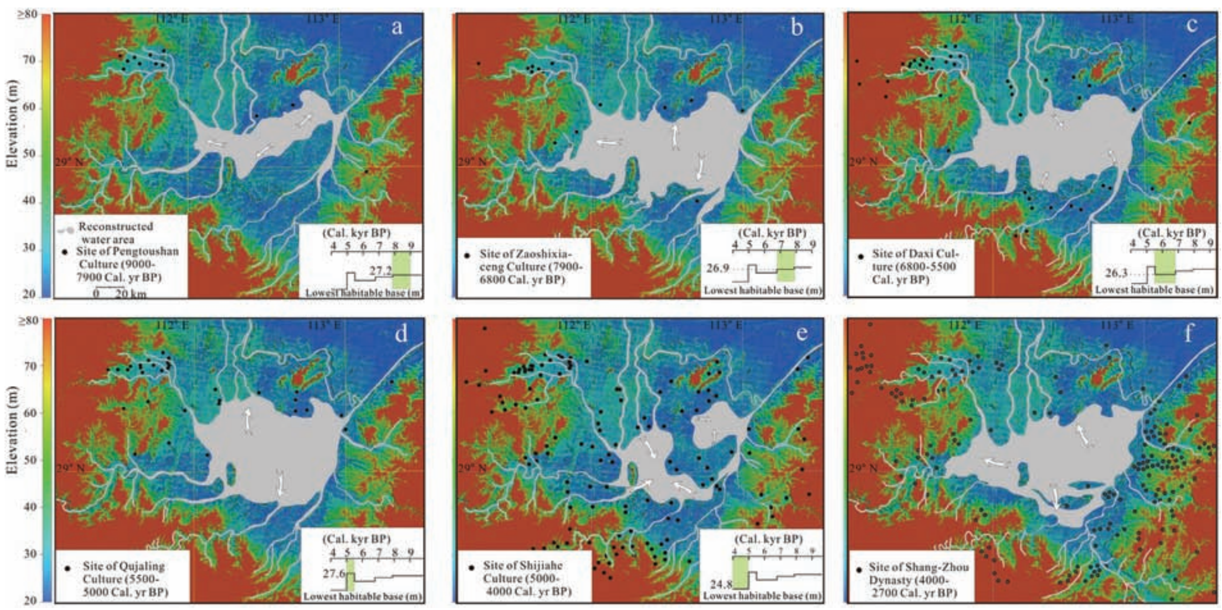
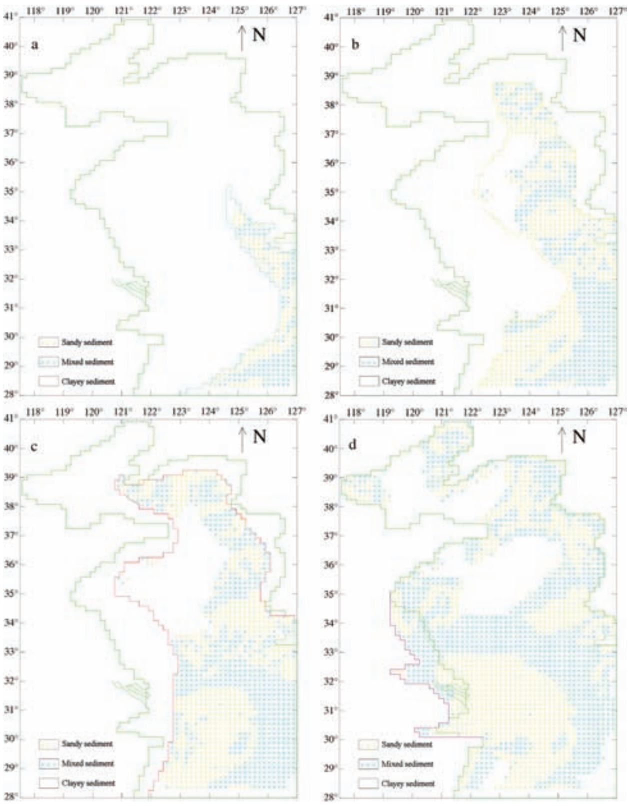


Fig. 4. Spatial and temporal migration of Neolithic settlements and related lake level fluctuations: (a) Pengtoushan cultural stage (9000–7900 cal. yr BP), (b) Zaoshixiaceng cultural stage (7900–6800 cal. yr BP), (c) Daxi cultural stage (6800–5500 cal. yr BP), (d) Qujialing cultural stage (5500–5000 cal. yr BP), and (e) Shijiahe cultural stage (5000–4000 cal. yr BP). Settlement of the historical stage (Shang and Zhou dynasty, 4000–2700 cal. yr BP) is also shown as (f). The lowest habitable base, derived from those sites on the lake shore and floodplain is also shown. The Holocene sediment stratigraphy and sediment isopachs as used in reconstructing lake levels.

Holocene evolution of bottom sediment distribution on the continental shelves of the Bohai Sea, Yellow Sea and East China Sea.

Chen, Q.Q., Zhu, Y.R., ***Sedimentary Geology***, 2012, 273-274: 58-72.

Coastline shifts due to transgression and regression can remodel tidal fields of continental shelves, and this can control transport of sediments and modulate sediment distribution accordingly. Tidal currents have become the dominant hydrodynamic processes on the continental shelves of the Bohai Sea, Yellow Sea and East China Sea (BYECS) since the transgression after the Last Glacial Maximum (LGM). To examine the evolution of the bottom sediment distributions on the continental shelves of the BYECS, we simulated patterns of tides and tidal currents, sediment transport, and bottom sediment types (sand, mud and mixed sediments) for five periods, corresponding to sea level lowstands of 80 m, 52 m and 30 m below present, the Holocene transgression maximum (HTM), and the present. The simulation shows that both sediment transport and shelf sediment distribution patterns were



controlled by the strength, type and asymmetry of tidal currents in the BYECS since the LGM. Evolution of shelf sediment distribution patterns occurred in two stages: (1) sediment emplacement and formation stage before the HTM, and (2) local adjustment after the HTM. The marked changes in coastline configuration since the LGM are the dominant factor controlling tide and tidal current evolution. Distribution of shelf sediment types in the BYECS is closely related to tidal current fields during transgression after the LGM.

Fig. 8. The distribution patterns of bottom sediment caused by sediment transport under the action of M_2 tidal currents on the continental shelves of the BYECS at four different sea level stages; (a): −80m; (b): −52m; (c): −30m; (d): attheHTM.

Mid-Holocene mangrove succession and its response to sea-level change in the upper Mekong River delta, Cambodia

Li, Z., Saito,Y., Mao, L.M., Tamura, T., Li, Z., Song, B., Zhang, Y.L., Lu, A.Q., Sieng, S., Li, J., ***Quaternary Research***, 2012, 78: 386-399.

Middle Holocene vegetation and mangrove successions are clearly evident in the palynological records of two cores from the upper Mekong River delta in Cambodia. Spanning from ~9.4 to 6.3 cal ka BP, the cores mainly record a transgressive sequence from floodplain freshwater marsh to tidal flat, which was overlain by mangrove. Corresponding to the decelerated sea-level rise at ~8.3 cal ka BP, pioneer mangrove species *Sonneratia alba* and *Sonneratia caseolaris* appeared in the sediments, and then was replaced by regressive mangrove succession containing upward-increasing abundances of *Rhizophora apiculata* and *Bruguiera* spp. High salinity- and flooding-tolerant community *S. alba* was developed at the western core site PSG at ~8.2 cal ka BP, and the eastern core site PK at ~7.5 cal ka BP. The time difference of *S. alba* appearance between the two sites might be resulted from the complexity of sedimentary environment, where a higher sediment supply was provided to the western floodplain than to the eastern floodplain. After 7.5 cal ka BP, aggradational stacking of intertidal sediments, of which the thickness is larger than the present maximum tidal range, may have resulted from continuous sea-level rise during 7.5–7.0 cal ka BP.

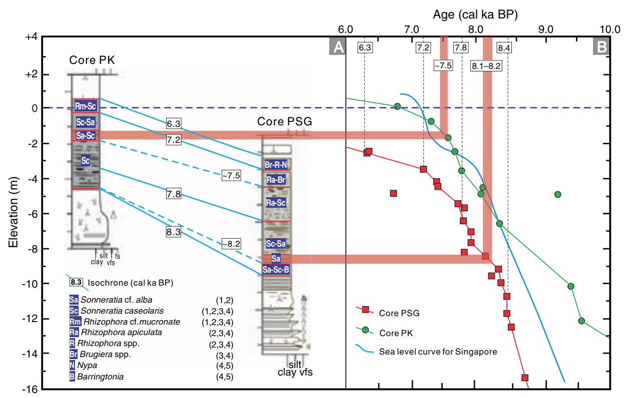


Fig. 6. Mangrove evolution (A) compared with sediment accumulation curve and sea level change (B). Inundation classes are shown by numbers in brackets: (1) flooded by all high tides; (2) flooded by medium high tides; (3) flooded by mean high tides; (4) flooded by spring tides; (5) flooded by equinoctial tides. Modified from Watson (1928), Hong and San (1993), Tamura et al. (2009) and Bird et al. (2010).

Assessing the potential for change in the middle Yangtze River channel following impoundment of the Three Gorges Dam

Yuan, W.H., Yin, D.W., Finlayson, B., Chen, Z.Y., ***Geomorphology***, 2012, 147-148: 27-34.

The geomorphic impacts of dams on downstream river channels are complex, not readily predictable for specific cases, but widely reported in the literature. For the Three Gorges Dam on the Yangtze (Changjiang) River in China, no studies of the impact of the changed flow and sediment conditions below the dam on the behavior of the channel were included in the pre-dam feasibility report. We have assembled a database of flow and sediment data for the middle Yangtze River from Yichang to Hankou and used this to analyse changes following the closure of the dam. While total flow is little affected, the operating strategy for the dam that provides for storage of part of the summer high flows to maintain hydroelectric power generation in winter (the low flow season) is reflected in changes to the seasonal distribution of flow below the dam. We calculated potential sediment carrying capacity and compared it with measured sediment concentrations for both pre- and post-dam conditions. While channel sedimentation is indicated along the middle Yangtze for pre-dam conditions, scour is indicated for post-dam conditions, highest at Yichang immediately below the dam and decreasing downstream.

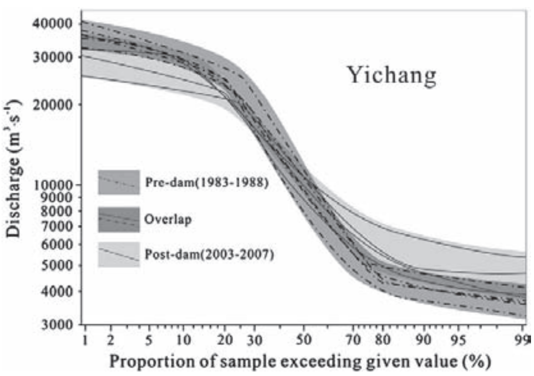


Fig. 3. Monthly flow duration curves at Yichang station for pre- and post-dam periods.

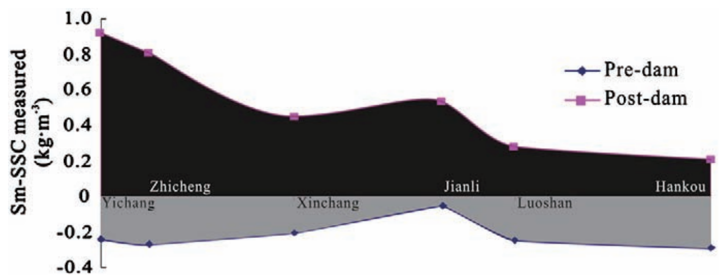


Fig. 8. Difference between calculated suspended sediment carrying capacity (Sm) and measured suspended sediment concentration (SSC) under pre- and post-dam conditions for stations in the middle Yangtze River. Positive values indicate the potential for scour, negative values indicate the potential for deposition.

Bedform characteristics during falling flood stage and morphodynamic interpretation of the middle–lower Changjiang (Yangtze) River channel, China

Chen, J., Wang, Z.B., Li, M.T., Wei, T.Y., Chen, Z.Y., ***Geomorphology***, 2012, 147-148: 18-26.

A survey was conducted to examine river bedforms using side-scan sonar, sub-bottom profiler and an Acoustic Doppler Profiler in the middle–lower (mid-lower) Changjiang (Yangtze) River (downstream of Wuhan), China, during August 14-20, 2003 when the discharge was 27,000–36,000 m^3s^{-1}. The results show bedforms of a range of sizes occur in the channel and their heights and lengths follow an exponential correlation below Flemming's maximum line. Not all bedforms were formed under the flow conditions experienced during the survey, as shown by comparison to three existing models in the literature. Small-scale bedforms with a length <60 m, defined as flat bed, mega-ripple and small dune in the present study, are mostly in equilibrium and are probably formed under the existing flow conditions. The large dunes with a length of >60 mare not in equilibrium and are believed to be the relicts of previous large discharges now undergoing adjustment. Different bedform types occur in the five river reaches in this section of the Changjiang (Wuhan–Tianjiazhen, Tianjiazhen–Anqing, Anqing– Maanshan, Maanshan–Jiangyin and Jiangyin–estuary downstream). In the narrow and single channel reaches above Anqing, large/small dunes are limited to the channel with higher water surface slope where stream power is strong enough for riverbed sediments to be moved frequently. In the downstream reaches between Anqing and Jiangyin, characterized by anabranching channels, small-scale bedforms superimposed on large dunes occur widely due to intensive riverbed sediment transport from frequent diverging/converging flow during both floods and low-flow periods. Mega-ripples and flat beds prevail in the lowermost channel below Jiangyin where wider cross-sections result in dispersed stream power.

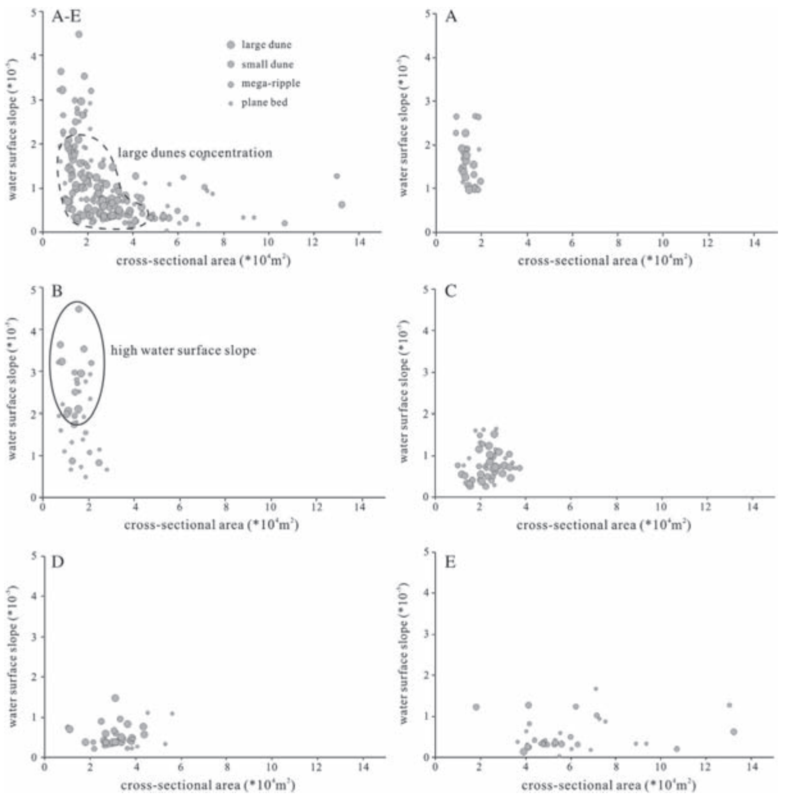


Fig. 5. Bedform types in relation to water surface slope and cross section area for all sites and for each reaches from A to E.

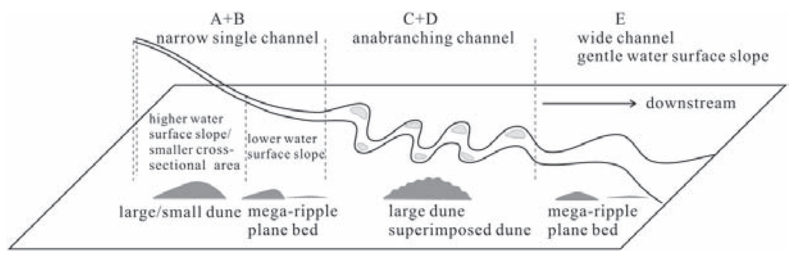


Fig. 8. Conceptual model of bedform types in relation to river channel morphology.

Effects of navigational works on morphological changes in the bar area of the Yangtze Estuary

Jiang, C.J., Li, J.F., Swart, H.E.D., ***Geomorphology***, 2012, 139-141: 205-219.

To improve navigability of the major access channel into Shanghai Harbor, a large-scale Deep Waterway Project was carried out in the North Passage (NP) of the Yangtze Estuary. In this paper, we investigate how the navigational works affected morphological changes of this channel, as well as those of the adjacent North Channel (NC), Hengsha East Shoal (HES), Jiuduansha Shoal (JDS), and the South Passage (SP). Morphological changes were assessed by analyzing digitized bathymetric data of this area prior to and after execution of the engineering works. The qualitative relations between these changes, along with the hydrodynamic changes as a result of the construction of engineering works, were subsequently investigated. The results reveal that the construction

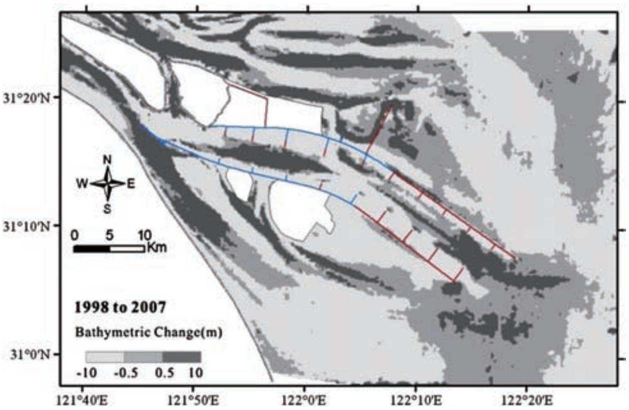


Fig. 3. Bathymetric changes after the navigational works in the bar area of the South Branch. Positive values indicate net erosion; negative values indicate net accretion.

of training walls, groins and jetties resulted in decreased ebb transport in the upper reach of the NP and increased ebb transport in the upper reach of the SP. In turn, this led to intensive upstream erosion with large amounts of sediment transported seaward in the SP and associated sedimentation in the downstream area. At the same time, intense siltation occurred in the upper reach of the NP, while the main channel of the NP mainly experienced erosion caused by the construction of training walls and groins that concentrated ebb flow in the main channel. The waterway deepened significantly in previously shallow areas. Small tidal channels in the HES, which used to connect the NP and the NC, were cut off by the northern training wall. Consequently, residual flow in the middle reach of the NC flowed directly toward the northern bank of the HES, leading to local erosion. Flow obstruction by the southern training wall reduced the upstream propagation of the flood tide in the SP. As a result, a collection of small flood channels evolved under the flushing action of flood currents in the JDS, preventing the natural trend of horizontal extension of the JDS. However, the flow obstruction enhanced the vertical accretion of the JDS.

Quantifying the anthropogenic and climatic impacts on water discharge and sediment load in the Pearl River (Zhujiang), China (1954-2009)

Wu, C.S., Yang, S.L., Lei, Y.P., ***Journal of Hydrology***, 2012, 452-453: 190-204.

Anthropogenic and climate influences on temporal changes in water discharge and sediment load were examined in the Pearl River in China. Increasing, undulating, and decreasing phases were found in the years 1954-1983, 1984-1993, and 1994-2009, respectively. Between 1954 and 1983, water discharge and sediment load increased by 18% and 32%, respectively. During an undulating phase between 1984 and 1993, a marked up in water discharge and sediment load was followed by suddenly rebounded discharge. From 1994 to 2009, water and sediment decreased by 32% and 83%, respectively. These trends were generally in agreement with changes in precipitation, suggesting climatic influences on a decadal timescale, although the changes in sediment load were also related to human activities. Human impact on sediment load can also be identified as three major phases. In the 1950-1970s, deforestation in the catchment was balanced by dam construction, resulting in no significant net change in sediment load. In the 1980s, however, the influence of the deforestation outweighed dam construction, resulting in an increase in sediment load. Since the 1990s, dam construction and soil preservation have decreased sediment load quickly, and the monthly sediment loads were lower in post-dams period than in the predams period. Since the closure of the Longtan and Baise Dams in 2006, the sediment load in the Pearl River has decreased by ~70% relative to the level of the 1950–1980s. Of this change, ~90% was caused by dam construction and ~10% was due to by climate change. In the coming decades, the sediment load in the Pearl River will probably continue to decrease as the new dams are built within the watershed.

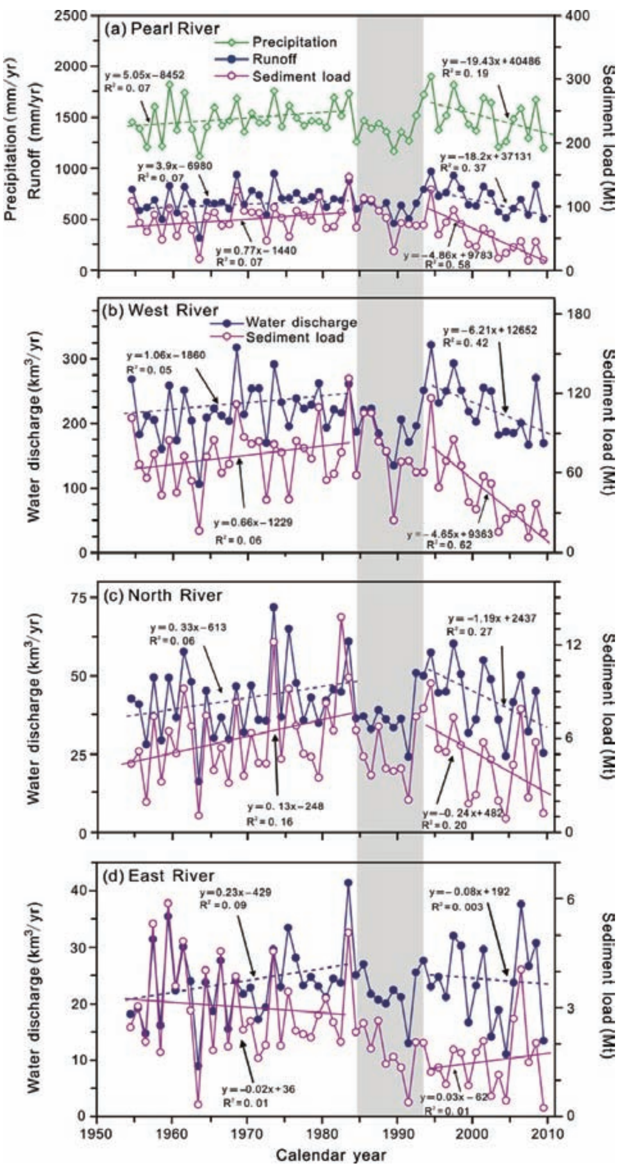


Fig. 3. Temporal variations in annual water discharge and sediment load in the (a) Pearl River; (b) West River; (c) North River; and (d) East River (the light gray region indicates the undulating phase between 1984 and 1993).

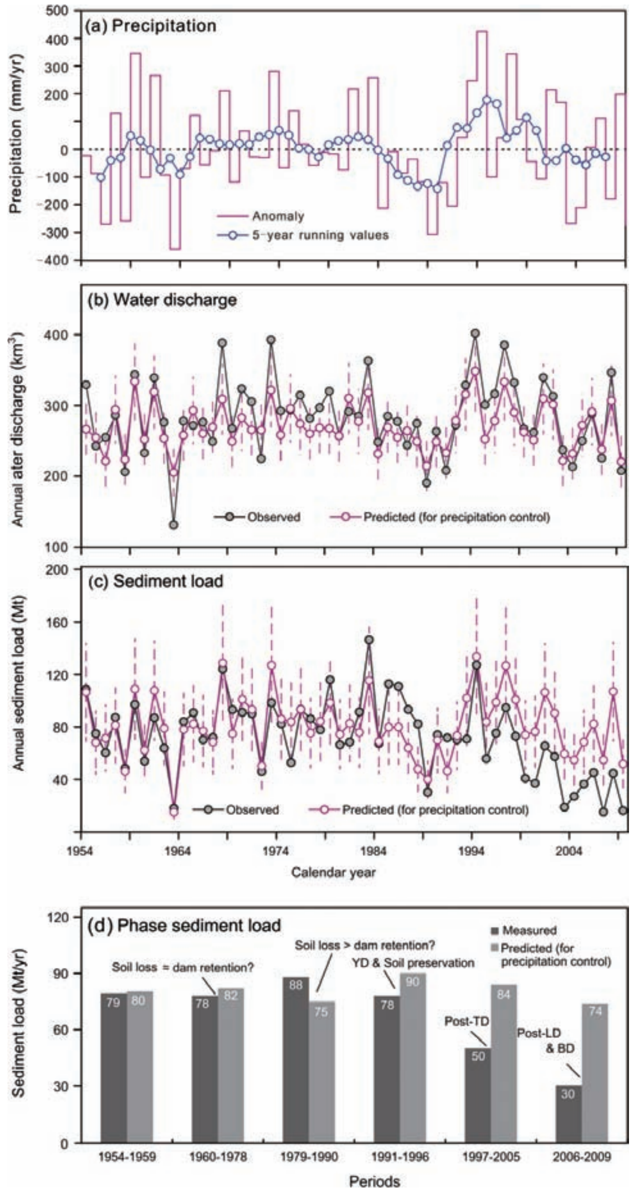


Fig. 12. (a) Anomalies in annual precipitation; (b) comparison of observed annual water discharge and predicted values based on a regression relationship between annual precipitation and water discharge for the period 1954–1959 (when human activities are assumed to have had no influence on annual water discharge); (c) comparison of observed annual sediment load with predicted values based on a regression relationship between annual water discharge and sediment load for the period 1954–1959 (when human activities are assumed to have had no influence on annual sediment load), for which the vertical line represents the error range for water discharge; and (d) comparison between period-averaged observed and predicted sediment loads, for which the vertical line represents the error range of sediment load (all data are for the Pearl River; comparisons of predicted mean annual sediment load and measured data are for six periods:1954–1959, 1960–1978, 1979–1990, 1991–1996, 1997–2005, and 2006–2009).

Impact of the three gorges dam overruled by an extreme climate hazard

Dai, Z.J., Chu, A., Stive, M.J.F., Yao, H.Y., ***Natural Hazards Review***, 2012.13(4):310-316.

While it is generally difficult to separate the impact of extreme climate events on river catchment conditions from that of human activities, there are unique data available to document this for the catchment area of the Yangtze in the years that the Three Gorges Dam (TGD) started to have an impact. During the second impoundment phase in 2006, the suspended sediment discharge (SSD) and water stored behind the TGD was 23×10^6 t and 11×10^9 m3, respectively, which is only 18% of the total SSD reduction and about 1% of the water discharge ($901\times10^9 m^3$) in 2005 at Datong. The total SSD and water discharge into the Yangtze Estuary in 2006 was 60 and 24% less than those in 2005, respectively. It can be quantified that the contribution of the extreme climate (drought) on discharge and SSD reduction was 95 and 82% of the total in 2006, respectively. In addition, it was found that the periods of high salinity (.250 and 400 mg/L) at Haimen that happened during the second impoundment phase accounted for 25 and 23% of the total occurrences in 2006, respectively. This analysis shows that the impact of extreme climate conditions can overrule the human interference, even for the largest dam, the TGD.

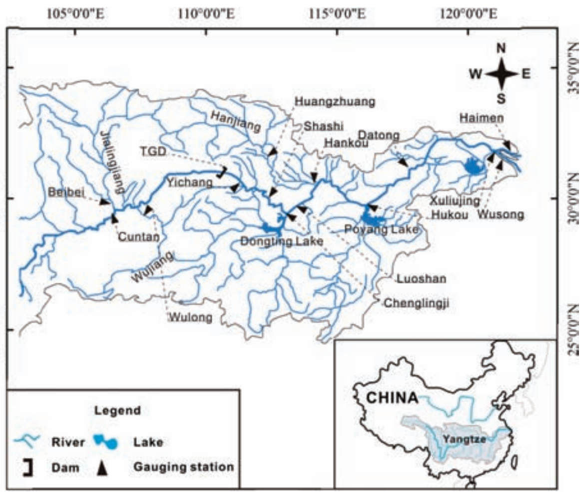


Fig. 1. Research area and gauging stations

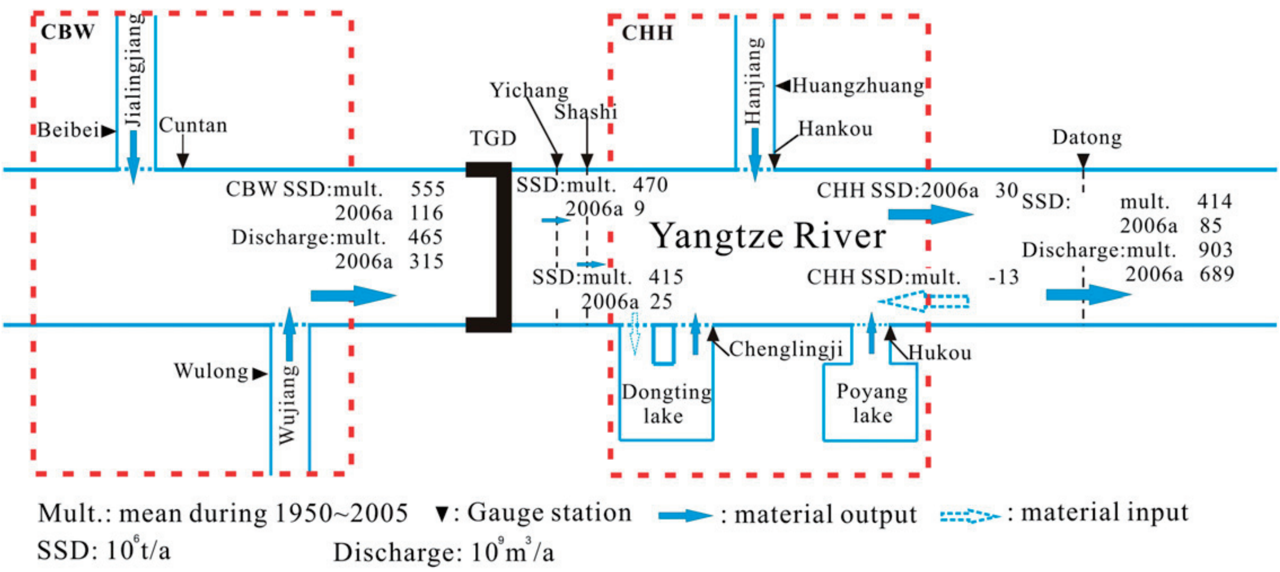


Fig. 2. Chart of SSD and water discharge change along the Yangtze River in 2006 and mean during 1950-2005 (Dai et al., 2012)

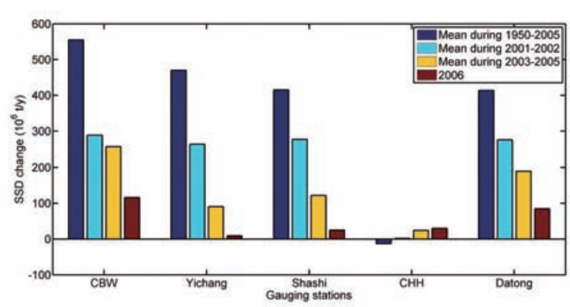


Fig. 5. SSD change at gauging stations in different years (CBW and CHH see Figure 2) (Dai et al., 2012)

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

A dike–groyne algorithm in a terrain-following coordinate ocean model (FVCOM): Development, validation and application

Ge, J.Z., Chen, C.S., Qi, J.H., Ding, P.X., Beardsley, R.C., ***Ocean Modelling***, 2012, 47: 26-40.

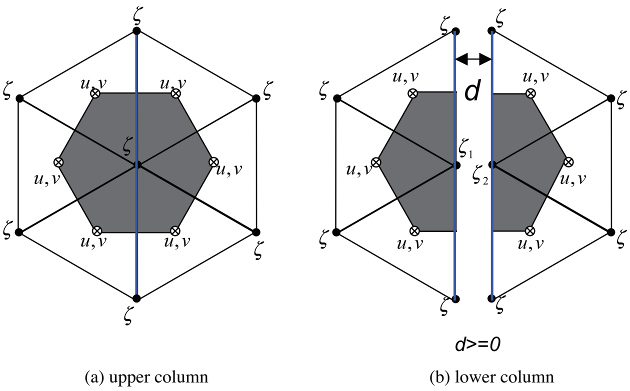


Fig. 2. Sketch of the separation of the control element at dikes or groynes. The shaded regions indicate the tracer control elements (TCEs).

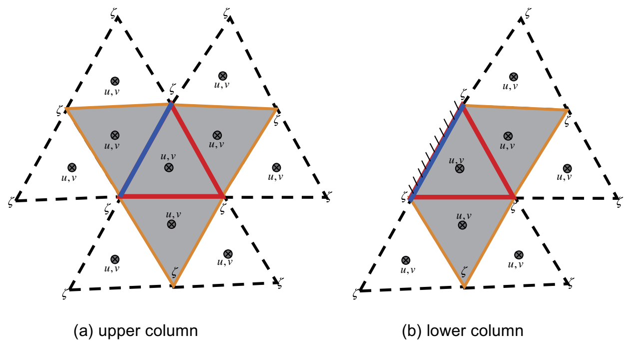


Fig. 4. Illustration of momentum control elements (shaded regions) used to calculate the horizontal velocity in the upper (above the height of the construction) and lower (below the height of the construction) layers.

A dike-groyne module is developed and implemented into the unstructured-grid, three-dimensional primitive equation finite-volume coastal ocean model (FVCOM) for the study of the hydrodynamics around human-made construction in the coastal area. The unstructured-grid finite-volume flux discrete algorithm makes this module capable of realistically including narrow-width dikes and groynes with free exchange in the upper column and solid blocking in the lower column in a terrain-following coordinate system. This algorithm used in the module is validated for idealized cases with emerged and/or submerged dikes and a coastal seawall where either analytical solutions or laboratory experiments are available for comparison. As an example, this module is applied to the Changjiang Estuary where a dike-groyne structure was constructed in the Deep Waterway channel in the inner shelf of the East China Sea (ECS). Driven by the same forcing under given initial and boundary conditions, a comparison was made for model-predicted flow and salinity via observations between dike-groyne and bed-conforming slope algorithms. The results show that with realistic resolution of water transport above and below the dike-groyne structures, the new method provides more accurate results. FVCOM with this MPI-architecture parallelized dike-groyne module provides a new tool for ocean engineering and inundation applications in coastal regions with dike, seawall and/or dam structures.

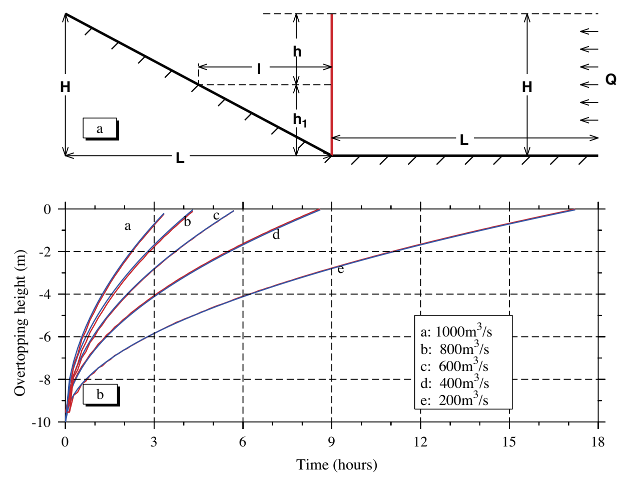


Fig. 5. Schematic of the model set up for the overtopping process experiments (a), model-data comparison of the overtopping depth (b) In panel *a: H:* the height of the seawall; *L:* the horizontal length of the land slope and ocean region; *Q:* the water discharge rate at the open boundary, *h:* the overtopping depth from the reference level; *h1:* the overtopping height from the bottom; and *l:* the distance from the seawall to the flooded edge on the landside. In panel *b:* blue lines are the analytical solutions, and red lines the model results. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

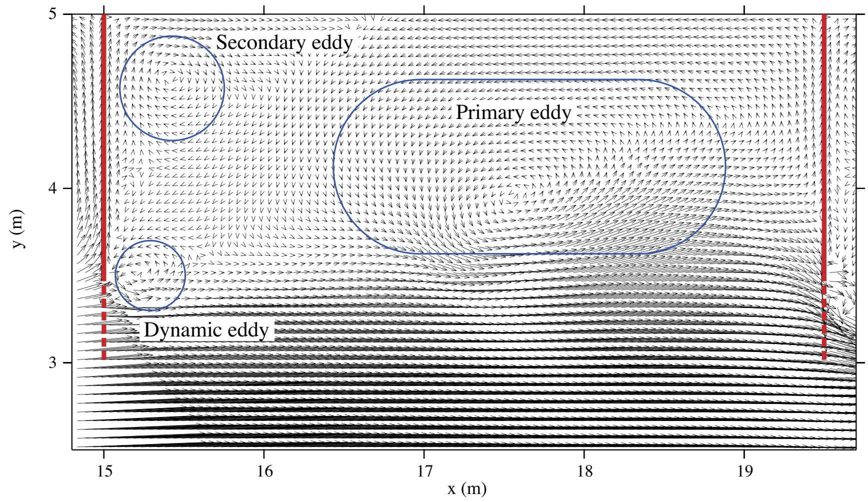


Fig. 7. Snapshot of simulated flow patterns in the fourth groyne field for Exp#1 under an emerged groyne condition. Solid red lines indicate emerged groynes, and dashed red lines indicate the submerged slope edges of groynes. Blue cycles show the locations of primary, secondary and dynamic eddies. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

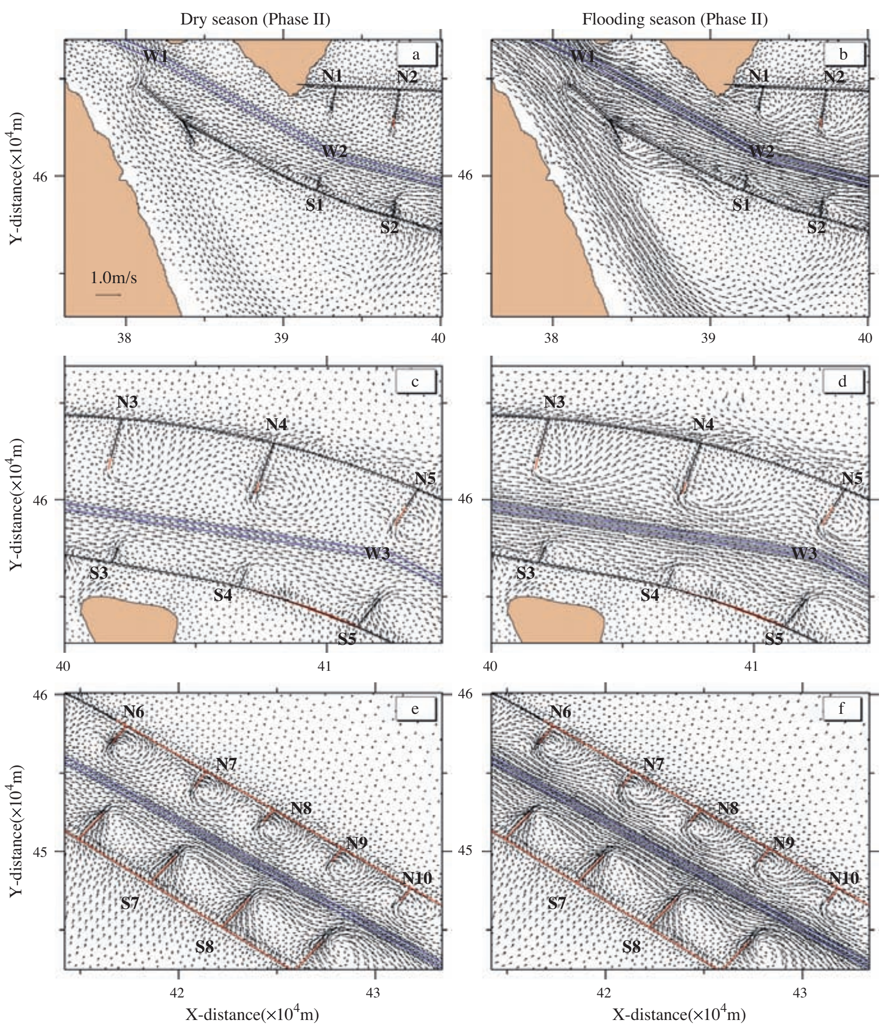


Fig. 15. Distributions of residual currents around the Deep Channel predicted by FVCOM under the freshwater discharge condition for the dry season (left column) and flood season (right column) with dike–groyne algorithm

Experimental study of near-wall turbulent characteristics in an open-channel with gravel bed using an acoustic doppler velocimeter,

Wang, X.Y., Yang, Q.Y., Lu, W.Z., Wang X.K., ***Experiments in Fluids***, 2012, 52: 85-94.

This experimental study investigated the mean velocity profiles, skin friction and turbulent characteristics of a gravel bed over a wide range of roughness using an acoustic Doppler velocimeter (ADV). The median diameter of bed material ranged from 2 to 40 mm, and the normalized roughness heights ranged from 47 to 4,881 mm. The flow regime was fully developed turbulence with a Reynolds number in the range of 4.2×10^4–9.86×10^4. All velocity curves exhibited logarithmic distributions, and the log-law region was influenced greatly by both the roughness and the Reynolds number. Moreover, the roughness of the gravel bed exerted a strong effect on Reynolds stress, and the turbulence tended towards isotropic with increasing roughness. Using statistical analyses, the third-order turbulence moments, sweep, and ejection motions were also examined. The results of this experimental analysis present a contrast to the classical wall similarity hypothesis.

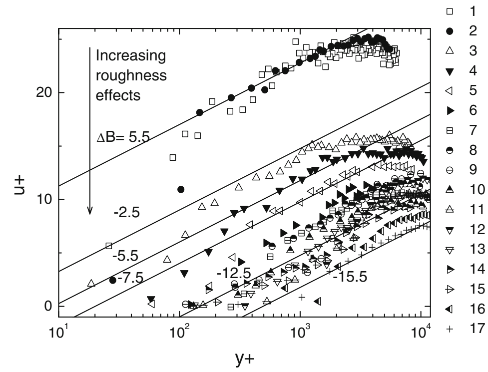
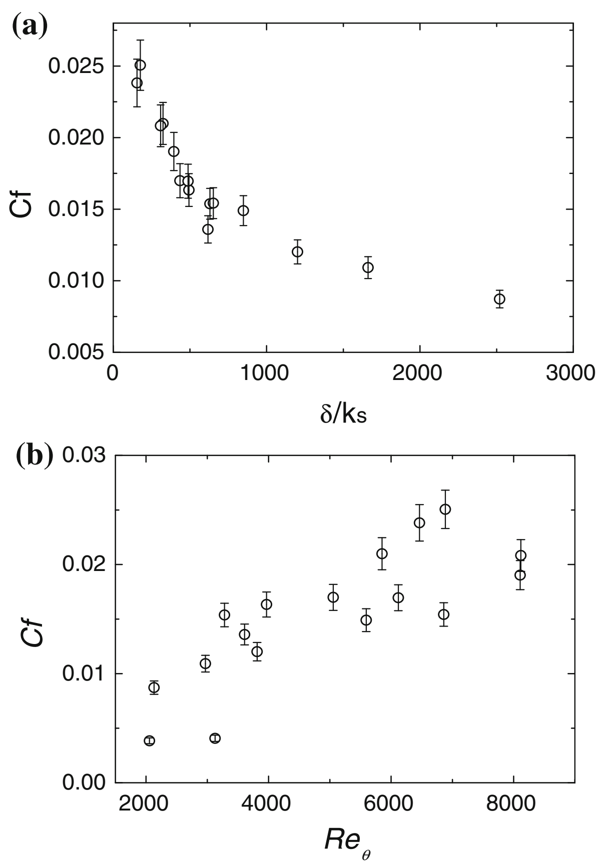


Fig. 4 Time-averaged velocity profiles



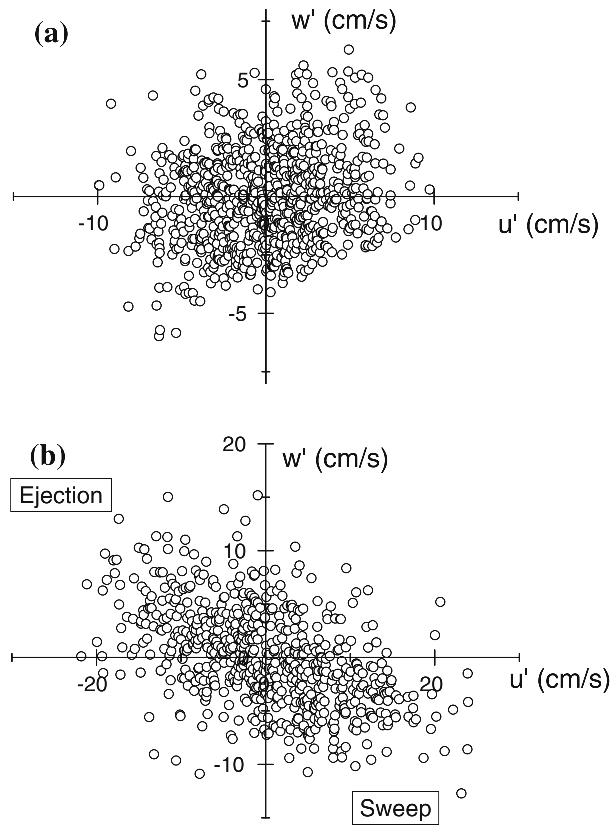


Fig. 5 Relationship between skin friction and a ratio of rough-wall momentum boundary-layer thickness to roughness height, b Reynolds number R_{eh} (overall uncertainty in C_f: ±7%)

Fig. 8 Quadrant plots of longitudinal and vertical flow velocity fluctuations of Run 15. **a** *h* = 2.85 cm; **b** *h* = 17.35 cm (overall uncertainty: ±1%)

Relating accretion and erosion at an exposed tidal wetland to the bottom shear stress of combined current-wave action.

Shi, B.W., Yang, S.L., Wang, Y.P., Bouma, T.J., Zhu, Q., ***Geomorphology***, 2012, 138: 380-389.

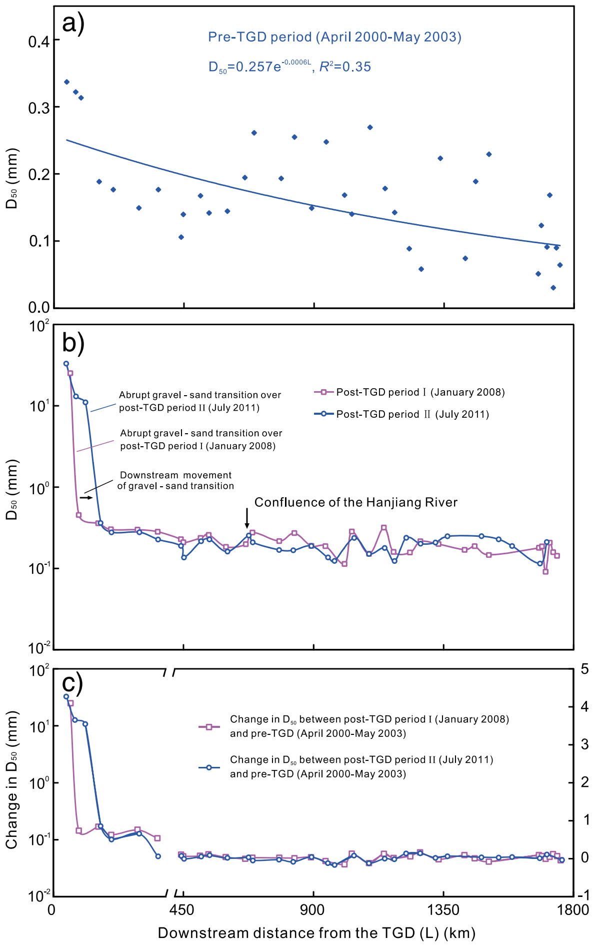


Fig. 2. (a) D_{50} values of bed sediments along the middle and lower Yangtze River, and the correlation between downstream distance and D_{50} over the pre-TGD period. (b) D_{50} values of bed sediments along the middle and lower Yangtze River over the two post-TGD periods with the abrupt gravel–sand transition indicated. (c) Changes in D_{50} from the pre- to post-TGD period along the middle and lower Yangtze River. All values represent a cross-channel sectional average of (typically) three samples

Sediment dynamics have an important influence on the morphological evolution of tidal wetlands, which consist of mudflats and salt marshes. To understand the nature of sediment behavior under combined current–wave action at an exposed tidal wetland, we measured the waves, currents, water depths, bed-level changes, and sediment properties at a mudflat–salt marsh transition on the Yangtze Delta, China, during five consecutive tides under onshore winds of ~8 m/s, and calculated the bed shear stresses due to currents (T_c), waves (T_w), combined current–wave action (T_{cw}), and the critical shear stress for erosion of the bottom sediment (T_{ce}). The bed shear stresses under combined current–wave action (T_{cw}) were approximately five times higher on the mudflat (up to 1.11 N/m^2; average 0.27 N/m^2) than on the salt marsh (up to 0.14 N/m^2; average, 0.06 N/m^2). On the mudflat, T_{cw} was larger than the critical erosion shear stress (T_{ce}=0.103 N/m^2) for 70% of the period of submergence, whereas τ_{cw} was always lower than T_{ce} at the salt marsh site (T_{ce}=0.116 N/m^2). This result indicates that the sediment dynamics on the mudflat were dominated by erosion, whereas at the salt marsh they were governed by deposition, which is in agreement with the observed bed-level change during the study period (−3.3 mm/tide on the mudflat and 3.0 mm / tide on the salt marsh). A comparison of T_{cw} values calculated using the van Rijn (1993) and Soulsby (1995) models for bed shear stresses under combined current–wave action indicates that both models are applicable to the present case and effectively predict the bottom shear stress under combined current – wave action. Overall, we conclude that T_{cw} in combination with T_{ce} is useful in assessing the hydrodynamic mechanisms that underlie the morphological evolution of exposed tidal wetlands.

Wave attenuation at a salt marsh margin: A case study of an exposed coast on the Yangtze Estuary

Yang, S.L., Shi, B.W., BoumaT.J., Ysebaert, T., Luo, X.X., ***Estuaries and Coasts***, 2012, 35: 169-182.

To quantify wave attenuation by (introduced) *Spartina alterniflora* vegetation at an exposed macrotidal coast in the Yangtze Estuary, China, wave parameters and water depth were measured during 13 consecutive tides at nine locations ranging from 10 m seaward to 50 m landward of the low marsh edge. During this period, the incident wave height ranged from <0.1 to 1.5 m, the maximum of which is much higher than observed in other marsh areas around the world. Our measurements and calculations showed that the wave attenuation rate per unit distance was 1 to 2 magnitudes higher over the marsh than over an adjacent mudflat. Although the elevation gradient of the marsh margin was significantly higher than that of the adjacent mudflat, more than 80% of wave attenuation was ascribed to the presence of vegetation, suggesting that shoaling effects were of minor importance. On average, waves reaching the marsh were eliminated over a distance of ~80 m, although a marsh distance of ≥100 m was needed before the maximum height waves were fully attenuated during high tides. These attenuation distances were longer than those previously found in American salt marshes, mainly due to the macrotidal and exposed conditions at the present site. The ratio of water depth to plant height showed an inverse correlation with wave attenuation rate, indicating that plant height is a crucial factor determining the efficiency of wave attenuation. Consequently, the tall shoots of the introduced *S. alterniflora* makes this species much more efficient at attenuating waves than the shorter, native pioneer species in the Yangtze Estuary, and should therefore be considered as a factor in coastal management during the present era of sea-level rise and global change. We also found that wave attenuation across the salt marsh can be predicted using published models when a suitable coefficient is incorporated to account for drag, which varies in place and time due to differences in plant characteristics and abiotic conditions (i.e., bed gradient, initial water depth, and wave action).

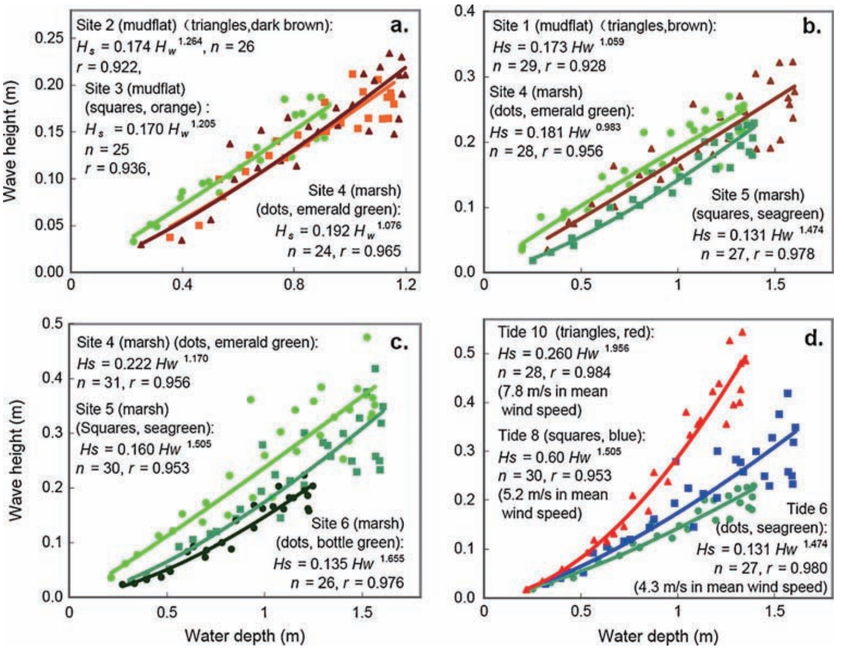


Fig. 4. Regression relationships between burst-based significant wave height (*Hs*) and water depth (*Hw*) over various tidal cycles (all significance levels are P<0.0001). The first three panels focus on the effect of location, whereas (d) shows the effect of wind speed, comparing (a) Sites 2, 3, and 4 during Tide 2; (b) Sites 1, 4, and 5 during Tide 6; (c) Sites 4, 5 and 6 during Tide 8; and (d) Tides 6 (slowest wind), 8 (medium wind), and 10 (strongest winds) at Site 5. The hourly mean wind speed (wind direction) ranged from 4.6 to 5.5 m/s (133−144°) for Tide 2, 3.8 to 4.8 m/s (129−134°) for tide 6, 1.1 to 9.4 m/s (353−74°) for Tide 8, and 7.3 to 8.4 m/s (357−2°) for Tide 10. Hourly maximum wind speed ranged from 4.7 to 14.8 m/s for Tide 8, and 11.1 to 13.1 m/s for Tide 10 (wind speed and direction data are shown in Fig. 5). n data number; r correlation coefficient

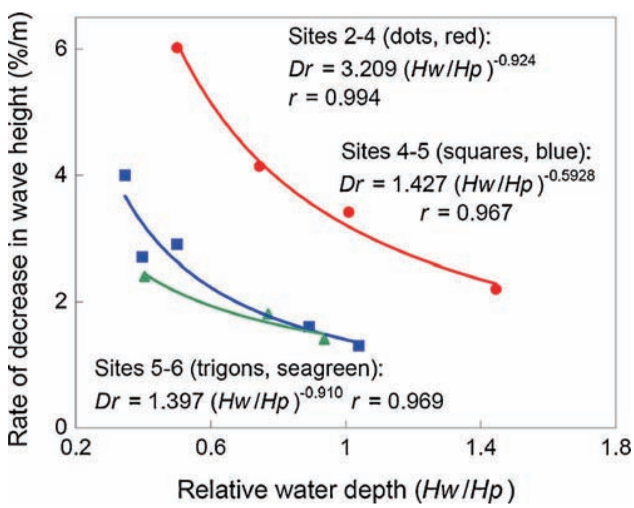


Fig. 6. Regression relationship between tide-averaged decreasing rate of significant wave height and relative water depth (defined as the ratio of water depth to significant plant height). *Dr* tide-averaged rate of decrease in wave height (%/m); *Hw* water depth at high tide (m); *Hp* average height of the tallest 33% of plant stems (m); r correlation coefficient. Data are taken from Table 1 (Sites 2–4 during Tides 1–4, Sites 4 and 5 during Tides 5–9, and Sites 5 and 6 during Tides 8–10)

Morphological impact of the construction of an offshore deepwater harbour in the Port of Shanghai, China

Ying, X.M., Ding, P.X., Wang, Z.B., Maren, D.S.V., ***Journal of Coastal Research***, 2012, 28: 163-173..

Yangshan Deepwater Harbor, located in the Qiqu Archipelago adjacent to Hangzhou Bay, is the new deepwater harbor of the Port of Shanghai. Its construction, which began in 2002, entails three types of engineering projects: closing a series of inlets, land reclamation, and dredging. After the construction of harbors 1, 2, and 3, these engineering projects caused a series of morphological changes in the area. Because of the serious sedimentation in the harbor area, further construction of the planned harbors has been stopped for the time being. Research on the sedimentation and its causes is urgently needed in order to decide whether to continue construction of more harbors. In this paper we analyze the morphological changes in the harbor area using bathymetric data collected from 1998 to 2010. Since 2004 bathymetry in the area has been surveyed every year, making it possible to analyze the spatial and temporal variation of sedimentation–erosion in detail. The analyses provide a good insight into how the morphological changes are related to the various projects of the harbor construction and how the changes develop over time. It is shown that in the year immediately after an inlet was closed accretion occurred on both sides of the closure. The sedimentation rates decrease significantly in the following years. Accretion accelerated from 2007 to 2009 but decreased thereafter. The results of the analyses indicate that routine dredging will be necessary to maintain the requisite 15-m depth requirement for berths, but a regular dredging routine is feasible. For a better understanding of the mechanisms responsible for the observed morphological changes a numerical model based on Delft3D is used to simulate the hydrodynamic and sediment transport processes. The model results provide insights into how the morphological changes are related to the changes in hydrodynamics induced by the closures of the inlets.

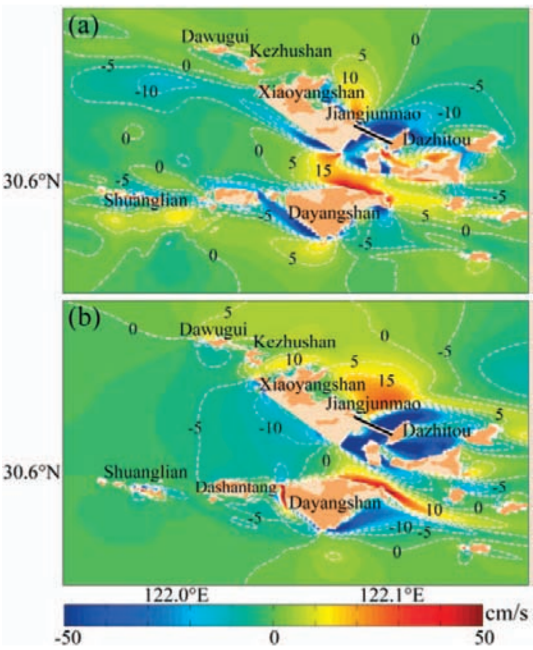


Fig. 14. Flow velocity increase (cm/s) due to closure of the third inlet (relative to the situation with inlets 1 and 2 closed). (a) Maximum flood (b) Maximum ebb.

Spatial, temporal, and human-induced variations in suspended sediment concentration in the surface waters of the Yangtze Estuary and adjacent coastal areas

Li, P., Yang, S.L., Milliman, J.D., Xu, K.H., Qin, W.H., Wu, C.S., Chen, Y.P., ***Estuaries and Coasts***, 2012, 35: 1316-1327.

To delineate temporal and spatial variations in suspended sediment concentration (SSC) in the Yangtze (Changjiang) Estuary and adjacent coastal waters, surfacewater samples were taken twice daily from 10 stations over periods ranging from 2 to 12 years (total number of samples >28,000). Synoptic measurements in 2009 showed an increase in surface SSC from 0.058 g/l in the upper sections of the estuary to ~0.6 g/l at the Yangtze River turbidity maximum at the river mouth, decreasing seaward to 0.057 g/l. Annual periodicities reflect variations in the Yangtze discharge, which affect the horizontal distribution and transport of SSC, and seasonal winds, which result in vertical resuspension and mixing. Over the past 10–20 years, annual surface

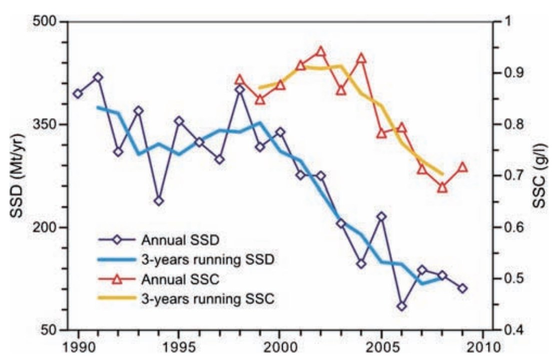


Fig. 7. Time series of annual surface suspended sediment concentration (SSC) at Xiaoyangshan and suspended sediment discharge (SSD) at Datong.

SSC in the lower Yangtze River and the upper estuary has decreased by 55%, due mainly to dam construction in the upper and middle reaches of the river. The 20–30% decrease in mean surface SSC in the lower estuary and adjacent coastal waters over the same period presumably reflects sediment resuspension, in part due to erosion of the subaqueous Yangtze Delta. SSCs in the estuary and adjacent coastal waters are expected to continue to decline as new dams are constructed in the Yangtze basin and as erosion of the subaqueous delta slows in coming decades.

Assessing C/N and $\delta^{13}C$ as indicators of Holocene sea level and freshwater discharge changes in the subaqueous Yangtze delta, China

Zhan, Q., Wang, Z.H., Xie, Y., Xie, J.L., He, Z.F., ***The Holocene***, 2012, 22 (6): 697-704.

To examine the applicability of C/N and organic carbon stable isotope ($\delta^{13}C$) in studies of the Holocene sea level and freshwater discharge in the large river mouth of Yangtze, we observed the distribution of carbon, nitrogen and $\delta^{13}C$ in a late-Quaternary core (ZK9) collected from the present subaqueous delta. We also collected published data of the two proxies for the suspended particulate matter (SPM) and surficial sediments from the lower Yangtze River to the adjacent East China Sea. The results show that the estuarine front is an important boundary for terrestrial and marine contribution of the organic component in the modern sedimentary environment. In the core ZK9, sediments deposited during *c.* 13–9 cal. ka BP are characterized by high values of TOC (0.54–1.16%), $CaCO_3$ (0.35% on average), and C/N (>12), which reflect an inner tidal estuarine environment dominated by C3 terrestrial organic carbon input. During *c.* 9–0.7 cal. ka BP, both TOC content (0.57% on average) and C/N ratio (<10) decrease remarkably while TN increases, indicating a lower estuarine or shallow marine environment. An abrupt sea level rise from *c.* 9 cal. ka BP resulted in a deeper water environment and reduced terrestrial input at the core location. The low $\delta^{13}C$ values (−24.23‰ on average) before *c.* 6 cal. ka BP reflect a dominantly terrestrial source of organic matter associated with increased freshwater discharge into the estuary during that time. The sediments since *c.* 6 cal. ka BP are characterized by increasing $\delta^{13}C$ up to −24.1 to −23.39‰, reflecting more contribution from marine algae as freshwater discharge fell. We suggest that in the Yangtze River mouth the C/N ratio indicates an abrupt sea level rise at *c.* 9 cal. ka BP, while $\delta^{13}C$ is more useful in reflecting freshwater discharge.

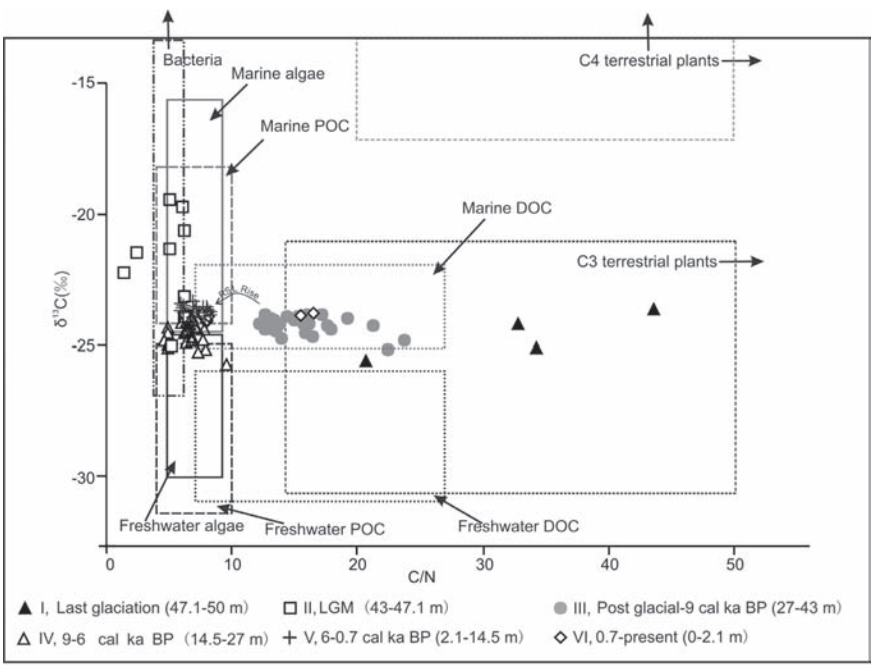


Fig. 5. Distribution of $\delta^{13}C$ and C/N of the core sediments in the correlation plots of different organic sources (modified after Lamb et al., 2006)

Magnetic and geochemical evidence of Yellow and Yangtze River influence on tidal flat deposits in northern Jiangsu Plain, China

Zhang, W.G., Ma, H.L., Ye, L.P., Dong, C.Y., Yu, L.Z., Feng, H., ***Marine Geology***, 2012, 319-322: 47-56.

The formation of a broad tidal flat along the coast of the northern Jiangsu Province of China depends largely on the sediment supply from the Yellow and Yangtze Rivers although the relative contributions from each of these two large rivers remain uncertain. Knowledge of sediment sources to the tidal flat is critical for understanding the evolution of this muddy coast impacted by the large rivers. The present study focuses on tracking the sediment source of the tidal flat deposits based on sediment magnetic properties and geochemical analyses as well as statistical analysis. The study shows that sediments to the north of Yangkougang (site 9) have lower values of saturation isothermal remanence magnetization (SIRM), magnetic susceptibility (χ), demagnetization parameter S_{-100} ratios, lower Fe/Al values and higher Ca concentrations, while the opposite is true for samples south to Haozhigang (site 18). In addition, SIRM values of the <16 μm and >63 μm fractions generally display increasing trend from north to south. These results suggest that sediment sources rather than particle size variation are the dominant factors influencing the bulk magnetic properties. In light of the sediment composition comparison between the Yellow River and Yangtze River, factor analysis is used to identify sediment source of the tidal flat sediments. It is indicated that the Yellow River in its former course is the dominant supplier for sites to the north of Yangkougang (site 9), while the Yangtze River is the dominant supplier for sites to the south of Haozhigang (site 18). The coast between Yangkougang (site 9) and Haozhigang (site 18) is a transition zone influenced by both rivers. The inferred provenance contrasts are consistent with the pattern of coastal geomorphological evolution. Our data also suggest that sediments eroded from the former Yellow River delta have contributed to the evolution of the Yangtze Estuary in historical time. This study demonstrates that a combined magnetic and geochemical fingerprinting techniques in couple with statistical analysis is valuable for identifying sediment sources of tidal flats and deltas influenced by large rivers in the world.

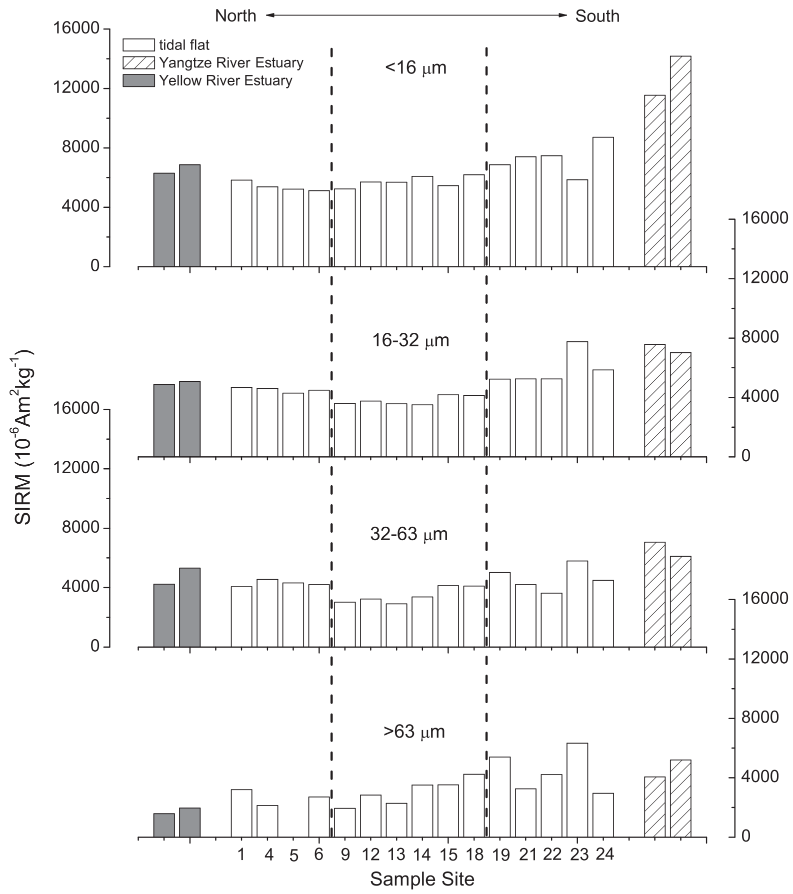


Fig. 5. Variations in SIRM values for particle size fractions (<16 μm, 16–32 μm, 32–63 μm and >63 μm). One sample has too small >63 μm fraction for magnetic measurements and therefore no data are available. The vertical dashed lines mark the boundaries of three zones as discussed in the text.

Magnetic properties of coastal loess on the Miaodao islands, northern China: Implications for provenance and weathering intensity

Zhang, W.G., Dong, C.Y., Ye, L.P., Ma, H.L., Yu, L.Z., ***Palaeogeography, Palaeoclimatology, Palaeoecology***, 2012, 333-334: 160-167.

Loess deposits are widely distributed over the islands in the Bohai Gulf and neighboring regions of northern China. The coastal loess, located to the east of the Chinese Loess Plateau (CLP), is believed to have a local source from exposed marine sediments and a distant source from inner arid regions in Asia. In this study, magnetic, geochemical and diffuse reflectance spectroscopic analyses were conducted on the loess to explore its relationship with the loess on the CLP and its paleoclimatic implications. We find that the coastal loess shows similar geochemical composition, background susceptibility and magnetic enhancement to loess on the CLP. Magnetic minerals characteristic of pedogenesis are more important in the paleosol layer, with fine ferrimagnetic minerals abundant in paleosol layer SB1 and hematite in paleosol layer SB2. Geochemical evidence suggests that weathering intensity in paleosol SB2 is similar to or even stronger than in paleosol SB1. Pedogenic enhancement of magnetic susceptibility in the study area is not so strong, which may be due to enhanced hematite formation as opposed to ferrimagnetic mineral production and preservation.

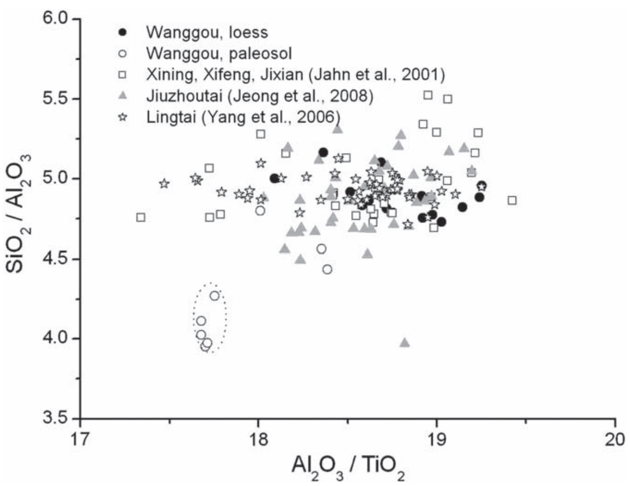


Fig. 9. Bi-plot of Al_2O_3/TiO_2 versus SiO_2/Al_2O_3, suggesting the coastal loess shows similarity with the loess on the Chinese Loess Plateau (Jahn et al., 2001; Yang et al., 2006; Jeong et al., 2008). Solid circles, open circles and open squares represent the loess, paleosol SB1 and paleosol SB2 samples, respectively. Some of the paleosol samples picked out in the dashed circles in the lower left corner have lower ratios, which could be the result of stronger weathering intensity.

Diatom evidence of climatic change in Holsteinsborg Dyb, west of Greenland,during the last 1200 years

Sha, L.B., Jiang, H., Knudsen, K.L., ***The Holocene***, 2012, 22: 347-358.

Diatom assemblages from Holsteinsborg Dyb on the West Greenland shelf were analysed with high temporal resolution for the last 1200 years. A high degree of consistency between changes in frequency of selected diatom species and instrumental data from the same area during the last 70 years confirms the reliability of diatoms (particularly sea-ice species and warm-water species) for the study of palaeoceanographic changes in this area. A general cooling trend with some fluctuations is marked by an increase in sea-ice species throughout the last 1200 years. A relatively warm period with increased influence of Atlantic water masses of the Irminger Current (IC) is found at ad 750–1330, although with some oceanographic variability after AD 1000. A pronounced oceanographic shift occurred at AD 1330, corresponding in time to the transition from the so-called 'Medieval Warm Period' (MWP) to the 'Little Ice Age' (LIA). The LIA cold episode is characterized by three intervals with particularly cold sea-surface conditions at AD 1330–1350, AD 1400–1575 and AD 1660–1710 as a result of variable influence of Polar waters in the area. During the last 70 years, two relatively warm periods and one cold period (the early 1960s to mid-1990s) are indicated by changes in the diatom components. Our study demonstrates that sedimentary records on the West Greenland shelf provide valuable palaeoenvironment data that confirm a linkage between local and large-scale North Atlantic oceanographic and atmospheric oscillations.

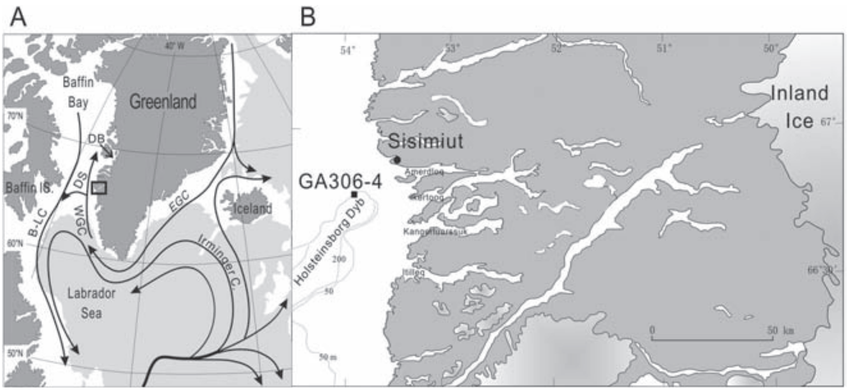


Fig. 1. (A) Oceanographic surface current system in the northern North Atlantic and around Greenland. EGC, East Greenland Current; WGC, West Greenland Current; B-LC, Baffin-Labrador Current; DS, Davis Strait; DB, Disko Bugt. (B) Location of core site GA306-4 in Holsteinsborg Dyb.

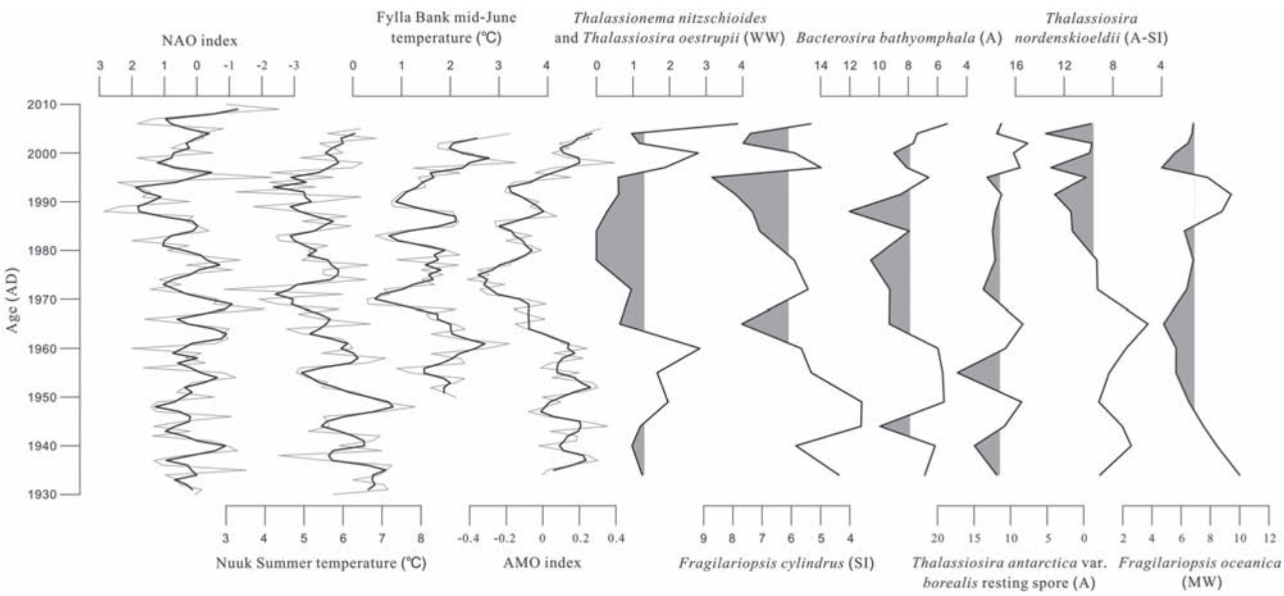


Fig. 3. Comparison of selected diatom species and species groups (percentages) for the time interval ad 1934–2006 with summer air temperature in Nuuk (West Greenland) and mid-June sea-surface temperature at Fylla Bank to the west of Nuuk (Buch et al., 2004; Vinther et al., 2006), as well as the annual Atlantic Multidecadal Oscillation (AMO) index (Enfield et al., 2001) and the North Atlantic Oscillation (NAO) index (Jones et al., 1997). Three point running means are shown for the instrumental data (black lines). The limit of grey shadings in the proxy data indicates mean value for each record. WW, Warm Water species; SI, Sea Ice species; A, Arctic species; A-SI, Arctic-Sea Ice species; MW, Mixing Water species (see also Figure 4).

河口海岸生态与环境

Estuarine and Coastal Ecology and Environment

Nutrients and particulate organic matter discharged by the Changjiang (Yangtze River): Seasonal variations and temporal trends.

Gao, L., Li, D.J., Zhang, Y.W., ***Journal of Geophysical Research – Biogeosciences***, 2012,117 G04001, doi:10.1029/2012JG001952

From September 2009 to August 2010, intensive monthly sampling of nutrients was conducted at two stations at the mouth of the Changjiang (Yangtze River). Particulate organic carbon (POC), particulate nitrogen (PN), and their stable isotope values ($\delta^{13}C$ and $\delta^{15}N$) were also measured in selected samples of all months. Most nutrients (nitrate, phosphate, ammonia, and nitrite) as well as POC, PN, and $\delta^{13}C$ displayed peak values when the highest or lowest Changjiang monthly discharges occurred, suggesting the Changjiang discharges strongly influence the seasonal variations of these chemicals. The sharply increases in concentrations of ammonia and nitrite in winter probably suggest nitrification was greatly depressed during this cold period. Using five interpolation methods, the annual discharge fluxes of nutrients, POC, and PN from the Changjiang to the East China Sea shelf were calculated. Combining this nutrient data with data from previous studies, the seasonal Mann-Kendall test, in which the influence of seasonal variation was considered, suggests concentrations of nitrate and phosphate in the Changjiang have significantly increased during recent decades at rates of 2.2 μM yr^{-1} and 0.03 μM yr^{-1}, respectively; no significant trend for silicate was noted. Decreased POC annual fluxes along with sharply decreased suspended particulate matter yields were also seen in recent years (1993–2010). However, no distinct changes of $\delta^{13}C$, $\delta^{15}N$, and the POC/PN ratio, which describe the particulate organic matter properties, were observed during this period.

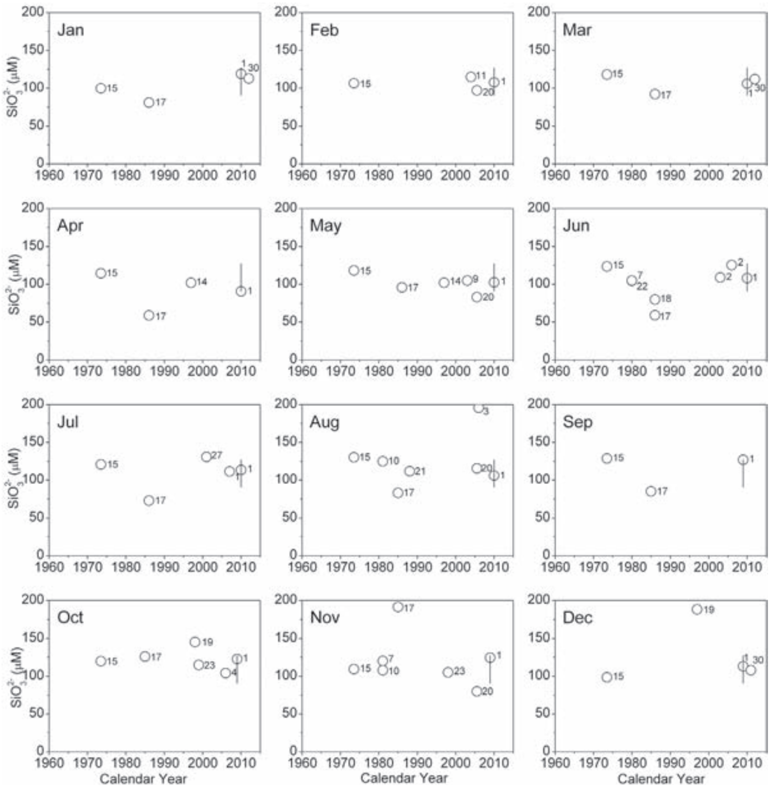


Fig. 7. Variations of the month-specific silicate concentrations near the Changjiang mouth in recent decades.The vertical lines in each panel and the numbers on the right of the data points have the same indications as those in Figure5.

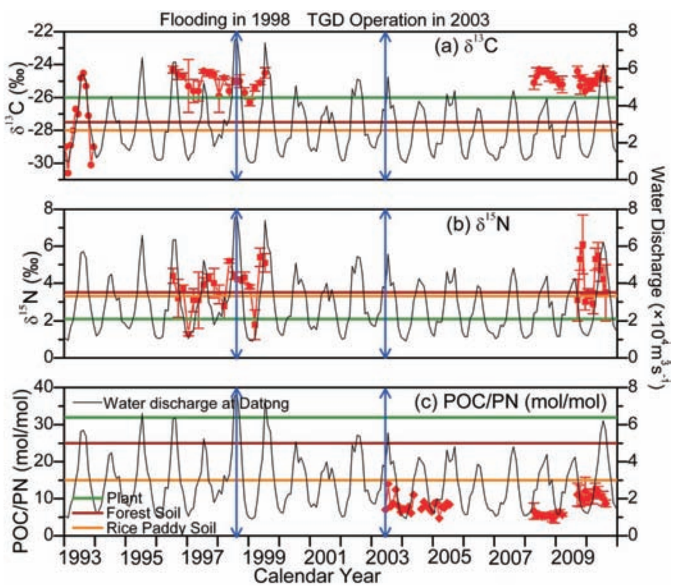


Fig. 9. Variations of the POM properties ($\delta^{13}C$, $\delta^{15}N$, and the POC/PN molecular ratio) discharged by the Changjiang (1993–2010). The POM property data are cited from *Cai and Han* [1998] at Datong (January 1993 to December 1993 in Figure 9a), from *Wu et al*. [2002] at Nantong (July 1996 to July 1999 in Figures 9a and 9b), from *Lin et al*. [2007] at Xuliujing (June 2003 to May 2004 and August 2004 to July 2005 in Figure 9c), from *Xu et al*. [2011] at Nantong (April 2008 to March 2009 in Figures 9a and 9c), and from this study at Xuliujing (September 2009 to August 2010 in Figures 9a–9c).

Transformation and fate of nitrate near the sediment–water interface of Copano Bay

Hou, L.J., Liu, M., Carini, S.A., Gardner, W.S., ***Continental Shelf Research***, 2012, 35: 86-94.

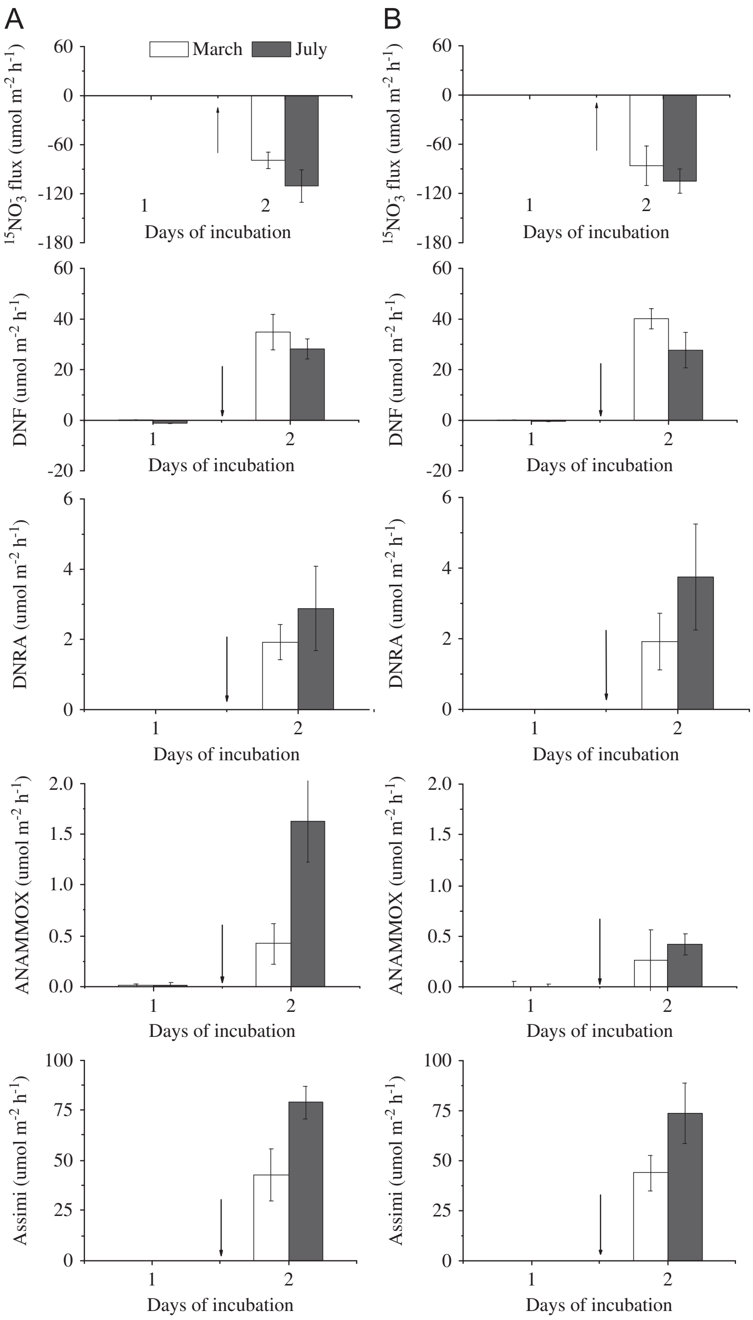


Fig. 2. $^{15}NO_3^-$ fluxes andtheratesof $^{15}NO_3^-$-based potential denitrification (DNF), DNRA and ANAMMOX before and after $^{15}NO_3^-$ addition. Arrows show the time of addition. Bars represent standard error of triplicate cores. A and B denote the west and east sites of the Copano Bay, respectively.

This study investigated potential transformation processes and fates of nitrate at the sediment-water interface of Copano Bay during a period of drought by conducting continuous-flow and slurry experiments combined with a $^{15}NO_3^-$ addition technique. Rates of $^{15}NO_3^-$ -based denitrification, an aerobic ammonium oxidation (ANAMMOX) and potential dissimilatory nitrate reduction to ammonium (DNRA) were in the range of 27.7-40.1, 0.26-1.6 and 1.4-3.8 μmol $^{15}N m^{-2}$ h^{-1}, respectively. Compared with the total $^{15}NO_3^-$ fluxes into sediments, dissimilatory processes contributed 29–49% to loss of the spiked $^{15}NO_3^-$. Based on the mass balance of $^{15}NO_3^-$, microbial assimilation was estimated to consume about 50–70% of the added $^{15}NO_3^-$, indicating that most of nitrate was incorporated by microorganisms in this N-limiting system. Inaddition, significant correlations of nitrate transformation rates with sediment characteristics reflect that the depth related behaviors of nitrate transformations in core sediments were coupled strongly to organic matter, iron (Fe) and sulfur (S) cycles.

Intercalibrated radionuclide activities in spiked water samples of the IAEA Worldwide Open Proficiency Test

Huang, D.K., Du, J.Z., Zhang, J., ***Journal of Radioanalytical and Nuclear Chemistry***, 2012, 292: 1241-1248.

Proficiency testing is one of methods for regularly assessing the accuracy of the analytical data produced by laboratories for particular measurements. In 2008 and 2010, we participated in the IAEA 2008 and 2010 worldwide open proficiency tests on the determination of natural radionuclides in water spiked with ^{226}Ra, ^{234}U and ^{238}U for activity analysis and with ^{90}Sr and ^{230}Th for gross alpha/beta analysis. Feedback statistics from the IAEA final report showed that the radioactivities of all of the samples fell within an acceptable range according to the IAEA. For ^{226}Ra analysis, our result showed that ^{229}Th–^{225}Ra is suitable as a chemical tracer, although there are doubts that different co-precipitation efficient between parent ^{229}Th and its daughter nuclide ^{225}Ra in published literature. The impact factors of the analysis results, such as the lower limit of detection, standard substances, the background and efficiency for daily determination, are discussed in detail.

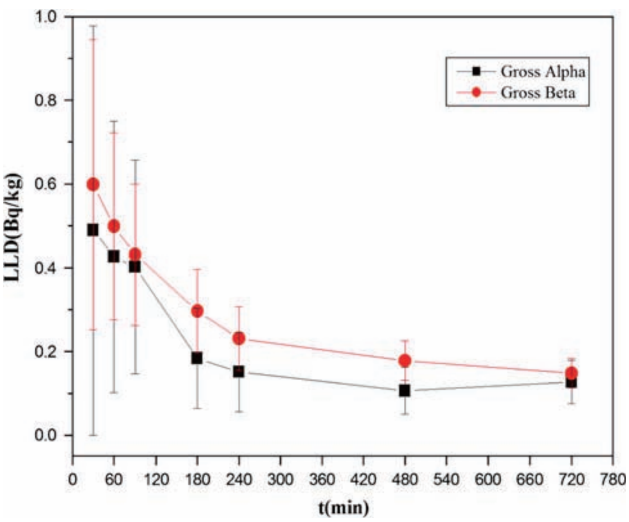


Fig. 4. The LLD of gross alpha/beta vs. detected time (the background count number was the background of trays without sample and the mass was assumed to be 5.00 g)

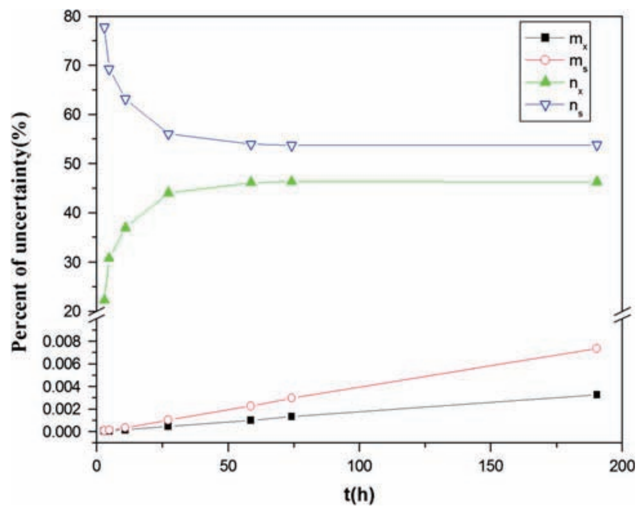


Fig. 5. The percent of each part in calculating the measured uncertainty vs. the detected time (30.00 g sample-3 of IAEA-CU-2010-03 with 2.000 dpm ^{232}U tracer)

Promotion of the lower limit of detection of gamma emitting nuclides in radioaerosol samples after Fukushima accident

Wang, J.L., Jiang, Y.F., Huang, D.K., Wen, T.Y., Du, J.Z., Zhang, J., ***Journal of Radioanalytical and Nuclear Chemistry***, 2012, 292: 1297-1301.

Through placement in a few hours after collecting radioaerosol samples (in Shanghai) after Fukushima nuclear power plant (NPP) accident, radionuclides with gamma-emitting rays can be found to be nuclides (^{132}I/^{132}Te, ^{129}I/^{129}Te) other than ^{131}I, ^{134,137}Cs because of the decrease in background baseline after the daughter nuclides (i.e. ^{214}Bi, ^{214}Pb and etc.) of radon makes decay sharply. Based on aerosol sample collected by passing through 1,300 M3 air in 24 h, the lower limit of detection (LLD) of ^{132}I/^{132}Te, 129I/129Te can be decreased from 6.11×10^{-5}, 3.46×10^{-4} Bq m^{-3} after half an hour sampling to 1.64×10^{-5}, 8.19×10^{-5} Bq m^{-3} after sampling 48 h sampling. Similarly, LLD can be decreased from 9.63×10^{-5} to 1.41×10^{-5} Bq m^{-3} for ^{131}I, 7.72×10^{-5} to 9.96×10^{-6} Bq m^{-3} for ^{134}Cs and 9.67×10^{-5} to 1.45×10^{-5} Bq m^{-3} for ^{137}Cs after the same time sampling. In the same time, the activities of daughter nuclides such as ^{214}Pb and ^{212}Bi from the decay of their parent nuclides ^{222}Rn and ^{220}Rn can sharply decrease from 2.45×10^{-2}, 2.57×10^{-2} Bq m^{-3} to be ~10^{-4} Bq m^{-3} while the activities of the concerned nuclides ^{132}I/^{132}Te, ^{129}Te, ^{131}I, ^{134,137}Cs were almost constant. As our knowledge, it is the first time to report such case which is very helpful to monitor the leaked nuclides from NPP by aerosol sampling in both normal operation case and emergency case.

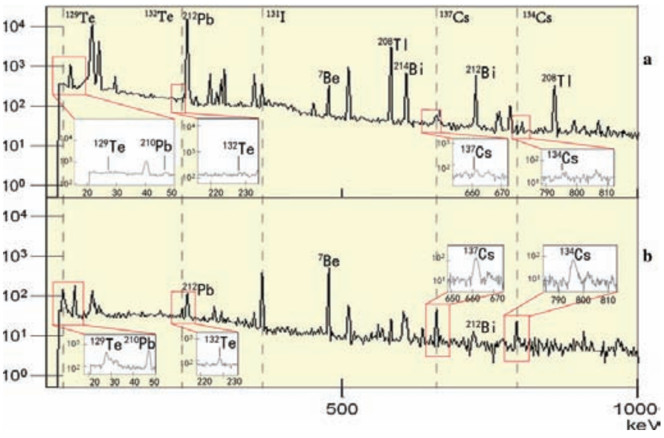


Fig. 2. Gamma-spectroscopy of aerosol in Shanghai after Fukushima accident: a for immediately determination and b for that after waiting 96 h later; *5 dash lines* show the positions (gamma energy peaks) for ^{129}Te(27.8 kev), ^{132}Te(228.2 kev), ^{131}I(364.5 kev), ^{137}Cs(661.6 kev) and ^{134}Cs(795.9 kev)

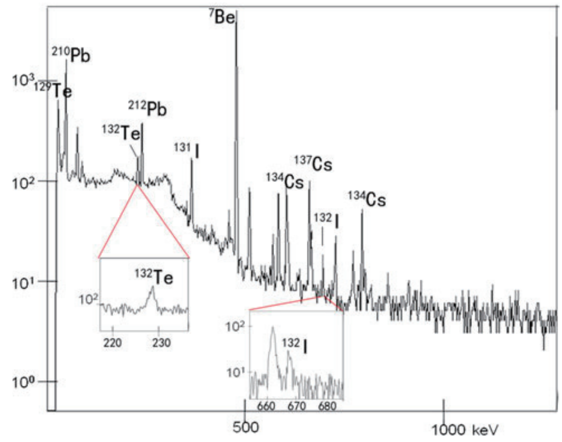


Fig. 4. The typical gamma spectroscopies of precipitation after coprecipitation collected during April 2nd of 2011: accounting time 12 h

Using radium isotopes to estimate the residence time and the contribution of submarine groundwater discharge (SGD) in the Changjiang effluent plume,East China Sea

Gu, H.Q., Moore, W.S., Zhang, L., Du, J.Z., Zhang, J., ***Continental Shelf Research***, 2012, 35: 95-107.

This paper reports the initial result of the flux of submarine groundwater discharge (SGD) into the Changjiang effluent plume (CEP). A radium mass balance model and a ^{224}Ra/^{223}Ra activity ratio (AR) apparent age model were applied to estimate the residence time of water above the pycnocline in the CEP. These two approaches gave similar results, yielding residence times of 5.4 d and 7.0 d, respectively, in the inner and outer plume zones. The nonconservative inventory of ^{226}Ra was established in the CEP, and converted to a ^{226}Ra flux by dividing by the water residence time and assuming steady state conditions. After subtracting the desorption of ^{226}Ra from suspended sediment and the diffusion from the bottom sediment, the ^{226}Ra flux from SGD was converted to a total SGD flux by dividing by the measured activity of ^{226}Ra in local groundwater. The SGD flux in the CEP is estimated to be 0.2–1.0x10^{9}m^{3} d^{-1}, which is equivalent to 6–30% of the Changjiang water discharge during flood season. This large flux indicates that SGD may be another important nutrient source to the East China Sea.

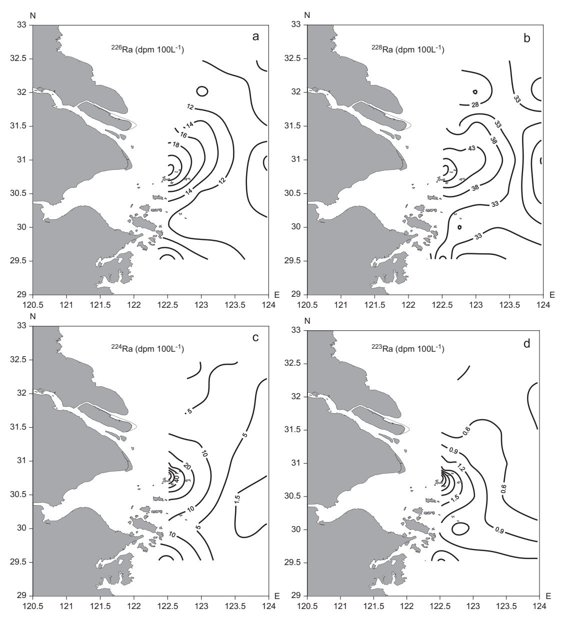


Fig. 7. Horizontal distributions of ^{226}Ra (a), ^{228}Ra (b), ^{224}Ra (c), and ^{223}Ra (d) of surface waters in the study area during August 2009.

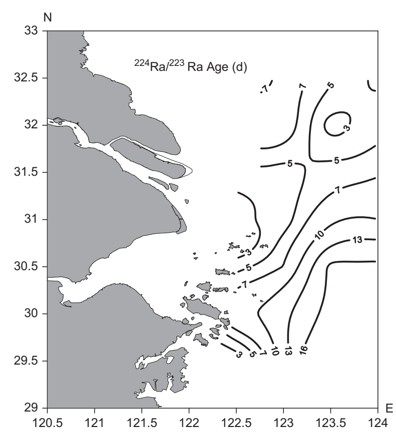


Fig. 11. Distribution of the apparent ages in the Changjiang effluent plume during August 2009.

Interactions between the range expansion of saltmarsh vegetation and hydrodynamic regimes in the Yangtze Estuary, China

Zhu, Z.C., Zhang, L.Q., Wang, N., Schwarz, C., Ysebaert, T., ***Estuarine Coastal and Shelf Science***, 2012, 96: 273-279.

Over the last 15 years, rapid invasion of large areas of the saltmarshes of Chongming Island, in the Yangtze Estuary, China by the exotic species *Spartina alterniflora* has occurred. Two types of advancing fronts are found: the *S. alterniflora*-mudflat (S-M front) and the *S. alterniflora* - *Scirpus mariqueter* - mudflat (S-S-M front). In this study, both the range expansion in terms of seedling recruitment and tussock development at these two advancing fronts and the accretion/erosion dynamics used as a proxy for comparable hydrodynamic regimes were investigated. The results showed that the mean number of seedlings of *S. alterniflora* recruited at the S-M front was much higher than that at the S-S-M front. The rate of range expansion after one growing season at the S-M front was much faster than the S-S-M front. The different colonisation behaviours on the two types of advancing front was related to the differences in hydrodynamic regimes. At the site with a regime of autumn/winter erosion and spring/summer accretion, the original pioneer species of *S. mariqueter* was replaced by *S. alterniflora* and a pattern of range expansion at the S-M front developed. In contrast, at the site with a relatively stable accretion regime, the original pioneer species of *S. mariqueter* remained within the advancing front and a pattern of range expansion at the S-S-M front developed. The impact of abiotic and biotic factors governing the range expansion of *S. alterniflora* and its implications on the spatial structure of tidal wetlands is discussed.

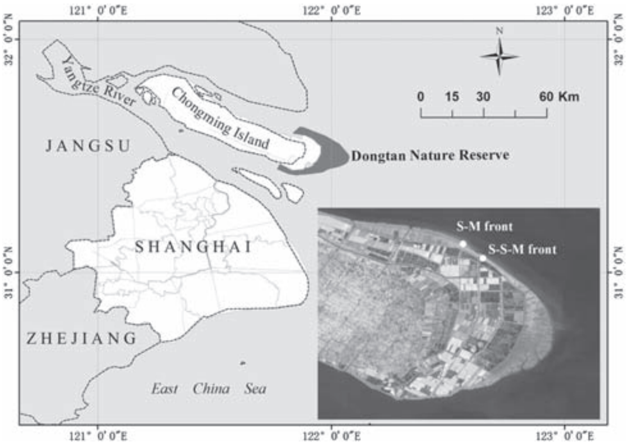


Fig. 1. The location of the Chongming Dongtan nature reserve as well as the measurement and sampling sites at the *Spartina alterniflora* - mudflat (S-M) front and the *S. alterniflora* - *Scirpus mariqueter* - mudflat (S-S-M) front.

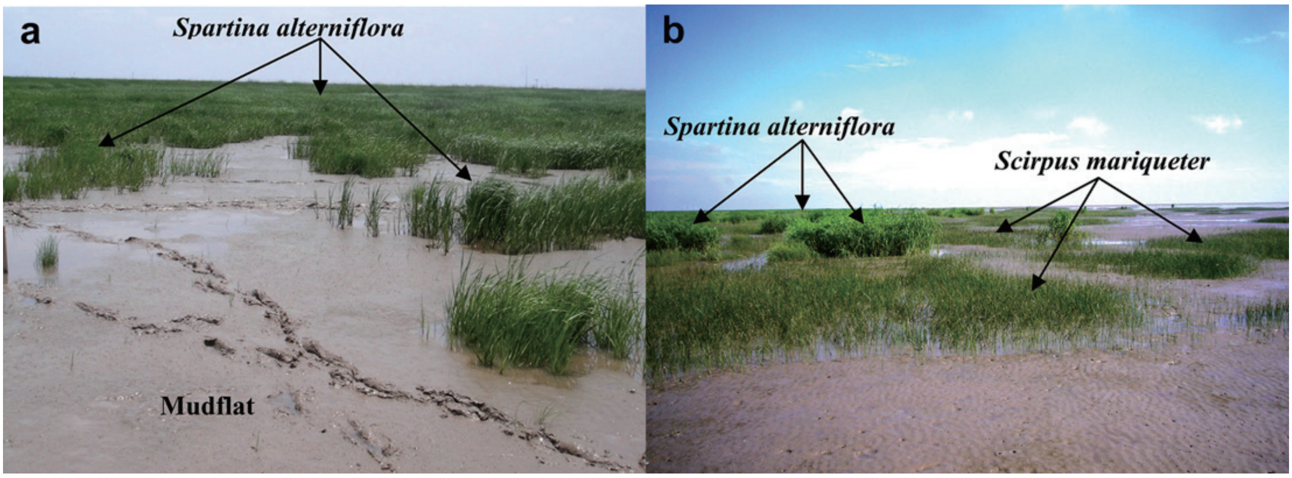


Fig. 2. Photographs of the advancing fronts of saltmarshes at the Chongming Dongtan Nature Reserve. a: the *Spartina alterniflora* - mudflat (S-M) front; b: the *S. alterniflora* - *Scirpus mariqueter* - mudflat (S-S-M) front.

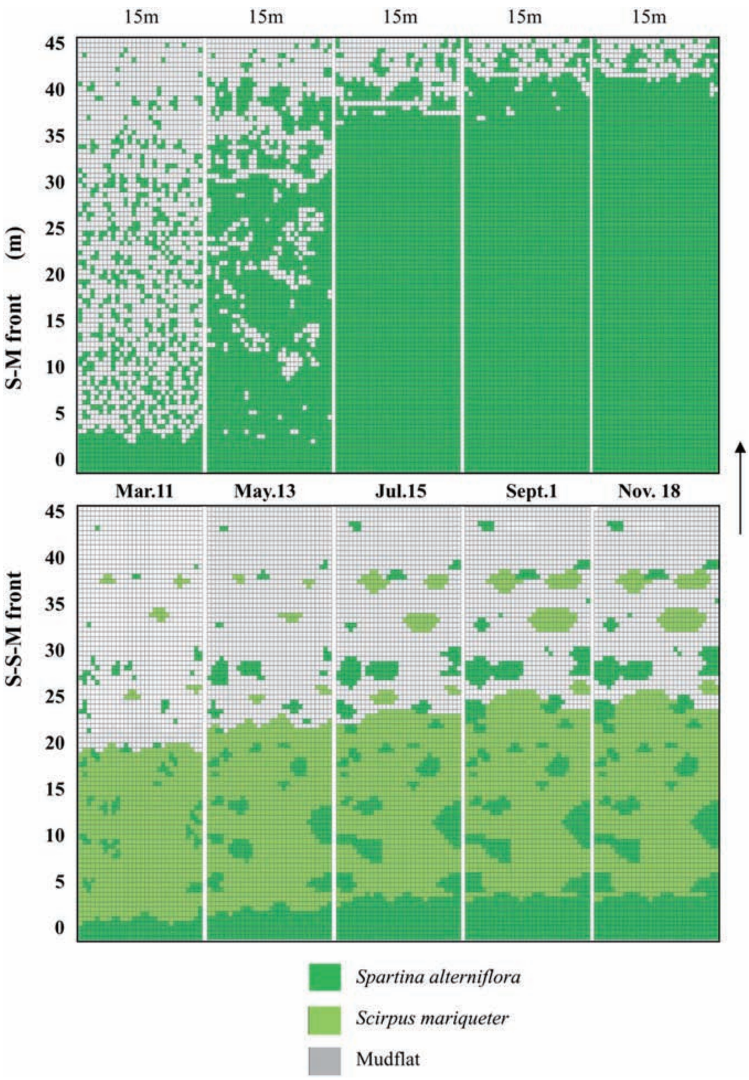


Fig. 6. Maps of range expansion of saltmarshes at the S-M and S-S-M fronts from March to November in 2010. Grids in different colours represent areas covered by *Spartina alterniflora, Scirpus mariqueter* and mudflat, respectively. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Division of labor in rhizomatous species: Comparative performance of native and invasive species in the tidal marshes of the Yangtze River estuary, China

He, Y.L., Li, X.Z., Guo, W.Y., Ma, Z.G., ***Journal of Experimental Marine Biology and Ecology***, 2012, 422-423: 122-128.

We compared reproductive characteristics of *Scirpus mariqueter* and *Spartina alterniflora* in monocultures and mixed communities to assess the importance of clonality in the population distribution and colonization of the two species. In the core *S. alterniflora* zone, individuals were taller and there were fewer underground tillers than in the *Spartina–Scirpus* zone. Every sexual *S. alterniflora* individual produced about two underground tillers in the *S. alterniflora* zone, which was two thirds as many as in the *Spartina–Scirpus* zone. In contrast, the height of sexual *S. mariqueter* was the highest in the mixed zone, whereas the numbers of flowering individuals and vegetative individuals were the highest in the core and the *Scirpus*–tidal flat zones, respectively. In the *Scirpus*–tidal flat zone each sexual individual produced 14 vegetative individuals, which was 23 times that produced in the mixed zone, and 45 times that in the core zone. Aboveground biomass and density of sexual individuals decreased from the core to the *Scirpus*–tidal flat zone. The ratio of aboveground to belowground biomass was lower in core zones of the two species than in their mixed zones. From the *S. alterniflora* to the tidal flat zone there was a decrease in salinity and redox potential and an increase in soil moisture.

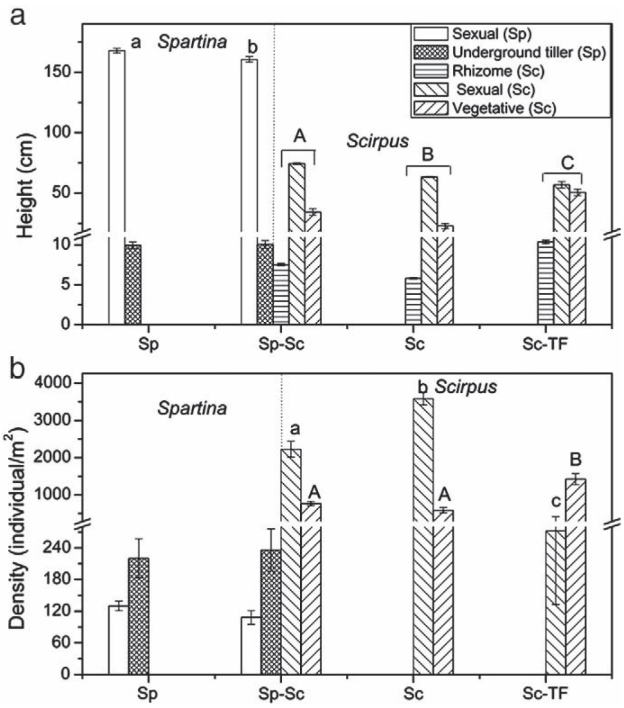


Fig. 3. The height and density of *Spartina* (a) and *Scirpus* (b) in different zones (Mean±SE). Means separated by the same letter are not significantly different (P>0.05) according to the honestly significant difference test. *Sp, Spartina* zone; *Sp–Sc*, the mixed zone of *Spartina* and *Scirpus*; *Sc, Scirpus* zone; *Sc–TF*, the front zone of *Scirpus* adjacent to tidal flat; TF, tidal flat.

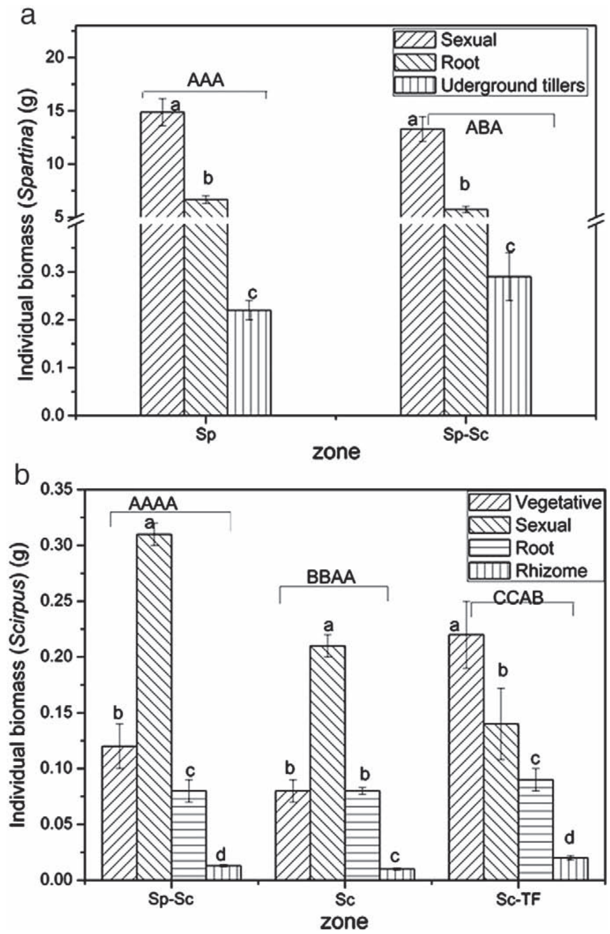


Fig. 4. The biomass allocation of *Spatina* (a) and *Scirpus* (b) in different zones (Mean±SE). The lowercase letters represent the difference among plant architectures in same zones; the capital letters represent the difference of plant architecture in different zones, each capital letter is corresponded with a bar of columnar section, respectively. Means labeled by the same letters are not significantly different according to honestly significant difference test (P>0.05).

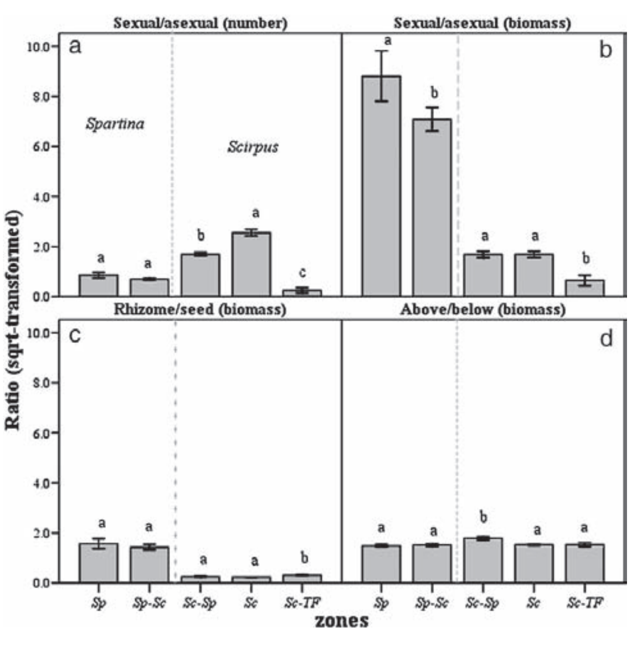


Fig. 5. a, The ratio of the number of sexual individual (the number of flowering individual of *Spartina* or *Scirpus*) to asexual individual (the number of vegetative individual of *Scirpus*) or underground tiller (*Spartina*); b, the ratio of biomass of sexual individual to asexual individual (*Spartina* and *Scirpus*); c, the ratio of biomass of rhizome to seed (*Scirpus*), the ratio of biomass of underground tiller to seed (*Spartina*); d, the ratio of biomass of aboveground to belowground (*Spartina* and *Scirpus*). *Sp, Spartina* zone; *Sp–Sc* and *Sc–Sp* represent the mixed zone of *Spartina* and *Scirpus* (the pre-and post-order of abbreviation represent the different species in mixed zone of *Spartina* and *Scirpus*, namely, *Sp–Sc* represents the *Spartina* in the mixed zone, *Sc–Sp* represents the *Scirpus* in mixed zone); *Sc, Scirpus* zone; Sc–TF, the front zone of *Scirpus* adjacent to tidal flat; TF, tidal flat.

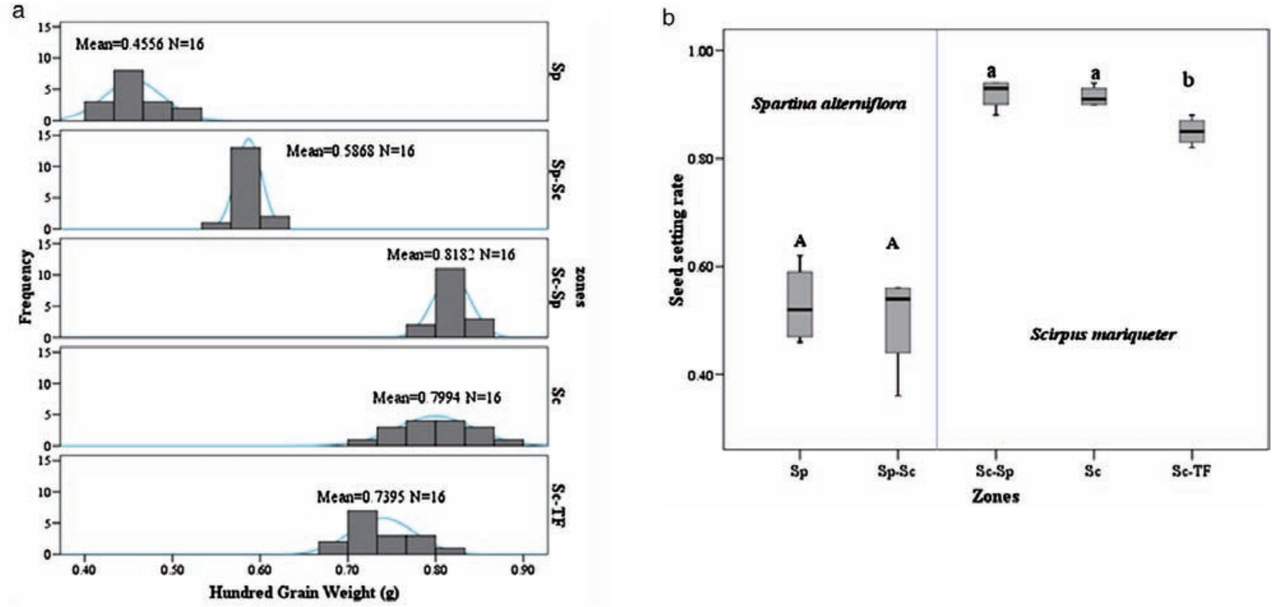


Fig. 6. (a) The histogram of hundred grain weight of *Spartina* and *Scipus*; (b) the boxplot of seed setting rate of *Spartina* and *Scirpus* in different zones. The abbreviations are the same as that in Fig. 5.

Measured and modeled biomass growth in relation to photosynthesis acclimation of a bioenergy crop (Reed canary grass) under elevated temperature, CO_2 enrichment and different water regimes

Ge, Z.M., Zhou, X., Kellomäki, S., Peltola, H.L., Biasi, C., ***Biomass & Bioenergy***, 2012, 46: 251-262.

The seasonal biomass growth and photosynthesis performance of a bioenergy crop, Reed canary grass (*Phalaris arundinacea* L.) under elevated temperature (ambient + 3.5 °C), CO_2 enrichment (700 μmol mol^{-1}) and different water regimes, was examined. To quantify the contributions of acclimated photosynthesis to biomass growth under the environmental treatments, a simplified model was parameterized to simulate the seasonal biomass accumulation of this bioenergy crop. As a result, we found that during the early growing periods, the photosynthesis, leaf development and above-ground biomass growth of the plants were enhanced under elevated temperature conditions, due to higher temperature sum for crop development compared to ambient temperature conditions. However, elevation of temperature resulted also in earlier senescence and lower total biomass of RCG at the final harvest, which effect was the most pronounced with low soil water table. As a comparison, CO_2 enrichment increased significantly the leaf development, photosynthesis and total biomass growth over the whole growing season. Under the combined elevation of temperature and CO_2, the acclimation of photosynthesis and total biomass of the plants at the final harvest was similar to those caused by elevated temperature alone. In general, high water table favored the photosynthesis and biomass growth of the plants. To conclude, the simplified model built for this bioenergy crop simulated well the dynamics of seasonal canopy photosynthesis and biomass growth, and with good accuracy. Meanwhile, the uncertainty of model was also discussed.

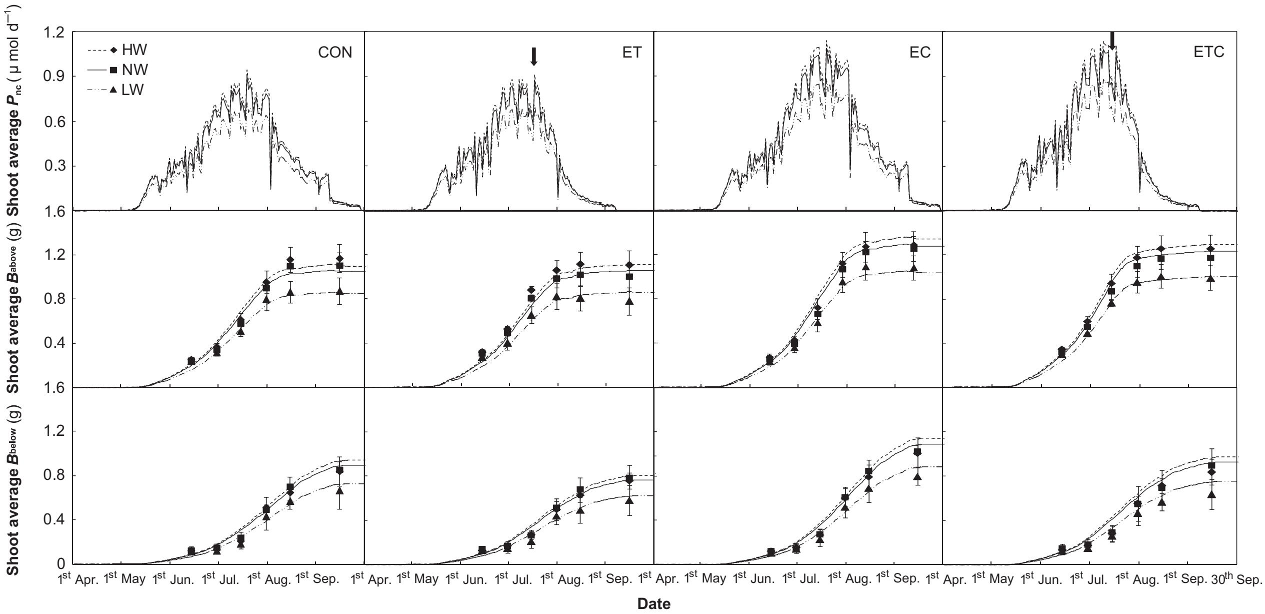


Fig. 4. Modeled (lines) canopy net photosynthesis (P_{nc}, per shoot) and biomass growth against measured (scatters) aboveground biomass (B_{above}, per shoot) and increment of below-ground biomass (B_{below}, per shoot) of RCG in the ambient climate (CON), elevated temperature (ET), CO_2 enrichment (EC) and elevated temperature and CO_2 (ETC) chambers combined with high (HW), normal (NW) and low (LW) water table level. The measured biomass data are the same presented in Figs. 2 and 3. The arrows indicated that P_{nc} began to be lower in the ET and ETC chambers than that in the CON and EC chambers, respectively.

Divergent teratogenicity of agonists of retinoid X receptors in embryos of zebrafish (*Danio rerio*)

Shi, H.H., Zhu, P., Sun, Z., Yang, B., Zheng, L., ***Ecotoxicology***, 2012, 21(5): 1465-1475.

Zebrafish (*Danio rerio*) embryos were comparably exposed to seven known agonists of retinoid X receptors (RXRs) including two endogenous compounds (9-*cis*-retinoic acid and docosahexaenoic acid), four manmade selective ligands (LGD1069, SR11237, fluorobexarotene and CD3254), and a biocide (triphenyltin). The dominant phenotypes of malformation were sharp mouths and small caudal fins in 1 mg/L SR11237-treated group after 5 days exposure. 9-*cis*-retinoic acid and LGD1069 induced multiple malformations including small eyes, bent notochords, reduced brain, enlarged proctodaems, absence of fins, short tails and edema after 5 days exposure. Fluorobexarotene and CD3254 induced similar phenotypes of malformations after 5 days exposure at low concentration (20 μg/L) to those after the 1st d exposure at high concentrations (50 and 100 μg/L). Triphenlytin induced multiple malformations including deformed eyes, bent notochords, bent tails, and edema in hearts after 5 days exposure at concentrations of 1–10 μg Sn/L. In contrast, no discernible malformations were observed in triphenlytintreated groups after each separate day exposure. These agonists not only showed different ability of teratogenicity but also induced different phenotypes of malformation in zebrafish embryos. In addition, the sensitive stages of zebrafish embryos were different in response to these agonists. Therefore, our results suggest that the agonists of RXRs had divergent teratogenicity in zebrafish embryos.

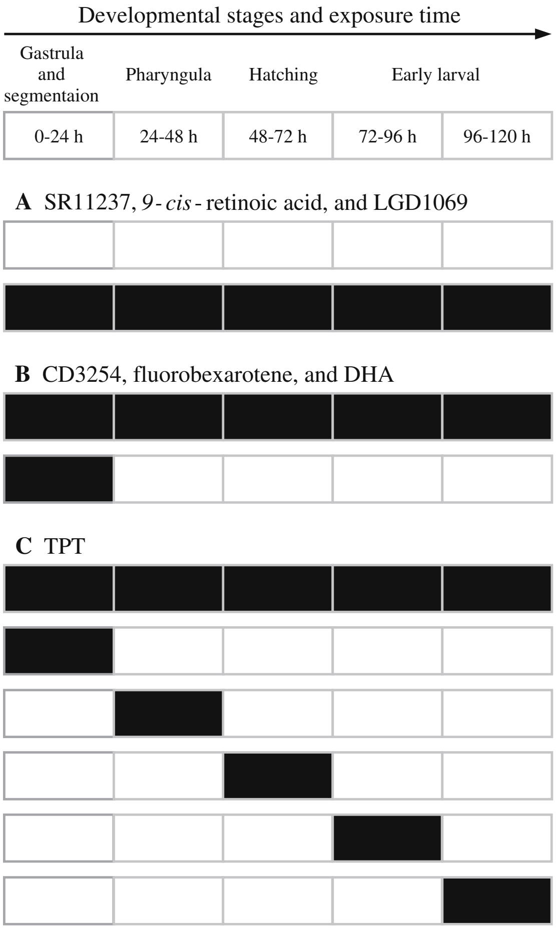


Fig. 2. The exposure windows in zebrafis (*Danio rerio*) embryos treated with agonists of retinoid X receptor. The *box* stands for the period without (*empty square*) or with (*filled square*) exposure to test substances and the *number in the box* stands for the exposure time

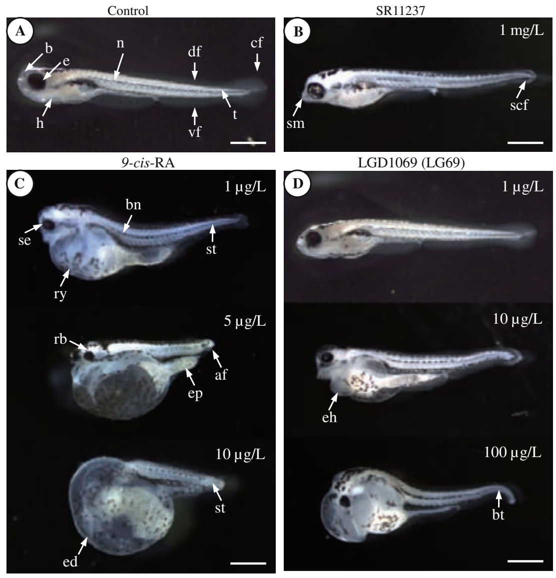


Fig. 3. Teratogenic effects of SR11237, 9-*cis*-RA and LGD1069 on zebrafis (*Danio rerio*) embryos after 120h exposure. Exposure began with embryos at early gastrula stage (5–6 hpf). *af* absence of fin, *b* brain, *bn* bent notochord, *bt* bent tail, *cf* caudal fin, *df* dorsal fin, *e* eye, *ed* edema, *eh* enlarged heart, *ep* enlarged proctodaeum, *h* heart, *n* notochord, *rb* reduced brain, *ry* retarded yolk-sac absorption, *scf* small caudal fin, *se* small eye, *sm* sharp mouth, *st* short tail, *t* tail, *vf* ventral fin, *Scale bar* 0.5 mm

论文专著
List of Peer Reviewed Publications

2012 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 64 篇，国内重要刊物 77 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 1 期，出版专著 1 册、科普读物 1 册。

In 2012, more than 160 peer-reviewed papers and books were published, among which 64 were published in international journals, 77 in national journals, 2 in international conference proceedings. Member of SKLEC edit a special issue in international journal Geomorphology and published 2 books.

国外刊物论文列表
List of International Peer Reviewed Publications

[1] Chen, J., Wang, Z.B., Li, M.T., Wei, T.Y., Chen, Z.Y.*, Bedform characteristics during falling flood stage and morphodynamic interpretation of the middle–lower Changjiang (Yangtze) River channel, China. ***Geomorphology***, 2012, 147-148: 18-26.

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[10] Ge, Z.M.*, Kellomäki, S., Zhou, X., Peltola, H.L., Seasonal physiological responses and biomass growth in a bioenergy crop (*Phalaris arundinacea L.*) under elevated temperature and CO_2, subjected to different water regimes in boreal conditions. ***BioEnergy Research***, 2012, 5: 637-648.

[11] Gu, H.Q.*, Moore, W.S., Zhang, L., Du, J.Z., Zhang, J., Using radium isotopes to estimate the residence time and the contribution of submarine groundwater discharge (SGD) in the Changjiang effluent plume, East China Sea. ***Continental Shelf Research***, 2012, 35: 95-107.

[12] He, Y.L., Li, X.Z.*, Guo, W.Y., Ma, Z.G., Division of labor in rhizomatous species: Comparative performance of native and invasive species in the tidal marshes of the Yangtze River estuary, China. ***Journal of Experimental Marine Biology and Ecology***, 2012, 422-423: 122-128.

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说明：以上文章列表只列入我室人员为第一作者或通讯作者的文章， 表示通讯作者。*

*Ps: The above list only includes the paper which first author or corresponding author is from SKLEC. * refers to corresponding author.*

平台与仪器
Facilities & Equipments

2012 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，与崇明县水文站合作增设横沙和长兴 2 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 2012, with support of the "985” and “211” Project from ECNU, and special funding from the Ministry of Science and Technology (MOST) of China, two hydrological observation stations were established along Changxing and Hengsha Islands through cooperation with Chongming County Hydrological Station. 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.

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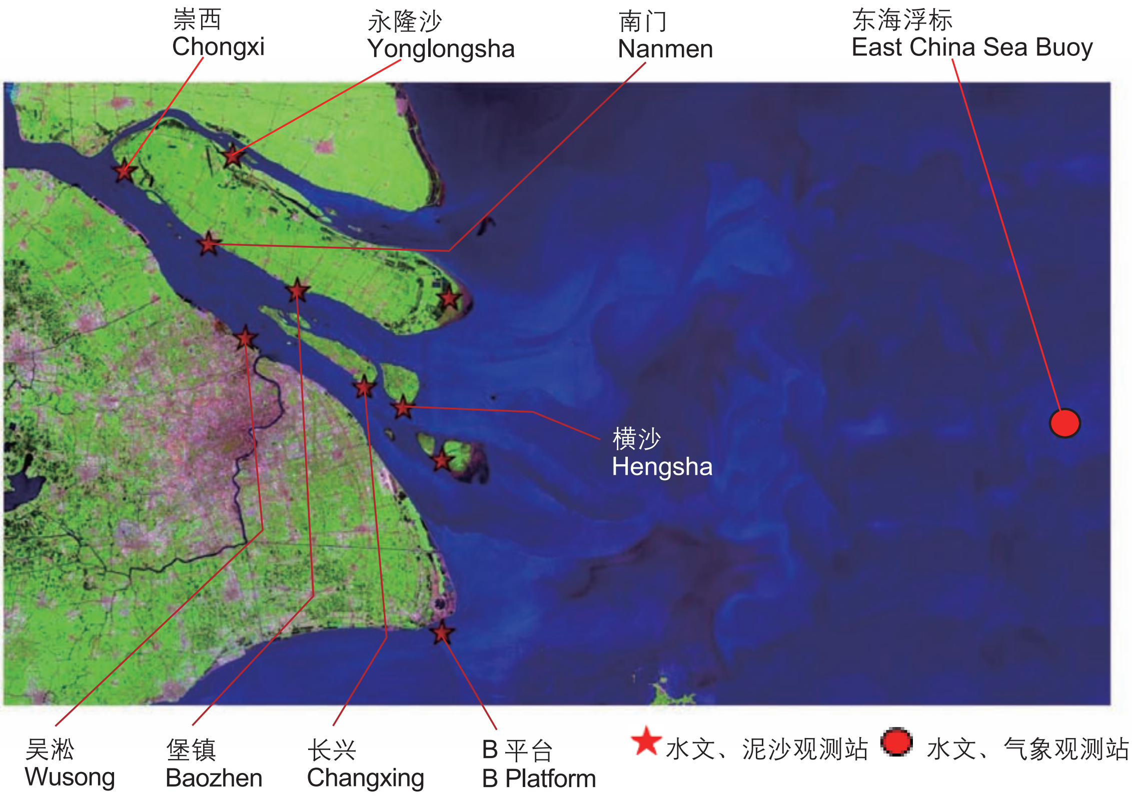
大体积抽滤系统 / Large Volume Water Transfer Sampler	McLane Company, Inc, USA / WTS-6-1-142LV
激光粒度分析仪 / Laser Diffraction Particle Size Analyzers	Beckman Coulter, Inc, USA / LS13 320
声学多普勒海流剖面仪 / ADCP-Acoustic Doppler Current Profiler	Teledyne RD Instruments Company, USA/ADCP WHK-300K
声学多普勒海流剖面仪 /ADCP-Acoustic Doppler Current Profiler	Teledyne RD Instruments Company, USA/ADCP WHRG-600K
GPS 卫星定位系统 /Global Positioning System	Trimble Company, UAS/Trimble-R8
激光测沙仪 /Laser In-situ Scattering and Transmissometry	Sequioc, USA /LISST-100
数字双频测深仪 / Accuracy Dual Frequency Echo Sounder	Teledyne RD Instruments Company, USA / ODOM III

平台建设
Facilities

野外水文、泥沙监测站
Hydrological and Sediment Monitoring Stations

2012 年，实验室与崇明县水文站合作增设横沙和长兴 2 个野外水文、泥沙长期监测站，主要用于风速、风向、温度、盐度、浊度和潮位等参数的获取。拟建立用于“东海海底观测网”的 2 个水下观测节点，目前系观测节点统已通过野外测试，计划 2013 年光缆铺设后上线调试、工作。

In 2012, two hydrology and sediment observation stations namely, Hengsha and Changxing, were established through cooperation with Chongming Country Hydrological Station. The parameters monitored included wind speed and direction, temperature, salinity, turbidity, and tide level. Two underwater observation nodes were designed and passed the field test, which will be open to use in 2013.



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

碳酸盐样品中硫同位素组成分析
Analysis of Sulfur Isotopic Compositions in Carbonates by HR-ICP-MS

实验室建立了离子交换树脂分离富集碳酸盐样品中硫的前处理方法，应用高分辨电感耦合等离子体质谱仪测定了碳酸盐样品中硫的同位素组成，此方法可推广应用于其它复杂环境样品中硫同位素组成的测定。

A method to separate and preconcentrate sulfur in carbonates with exchange resin, and determination of sulfur isotopes by high resolution inductively coupled plasma mass spectrometry (HR-ICP-MS), was established in our laboratory. This method can also be applied to other similar complex environmental samples in the determination of sulfur isotopic compositions.

浮游植物光合色素分析方法的改进
A Modified Method for Determination of Phytoplankton Pigments by HPLC

我们对之前采用高效液相色谱法测定浮游植物光合色素的分析方法进行了调整和改进。引入了新的分析光合色素的方法，并在该台设备上进行了方法的有效性验证。以新方法为基础，进行了大量现场实际样品的分析，服务于我校作为主持单位所开展的科技部 973 项目等科研项目的开展。
We modified the method for the determination of phytoplankton pigments using HPLC, and further established a new method based on published literature. Based on this new method, we analyzed a large amount of samples collected from the regions of East China Sea and the Yangtze River. This provided good support to the on-going project.

颗粒态氨基酸分析
Analysis of Amino Acids Enantiomers in Particulates By HPLC-MS

我们应用高效液相色谱 – 质谱联用仪开展了颗粒态氨基酸 (手性对应体) 的定性、定量分析工作，并已经在实验室成功建立起该套方法；目前正在积极开展针对溶解态样品的手性氨基酸分析方法的建立。
We performed the establishment of the measurement of amino acids enantiomers in particulates using HPLC-MS. This method has now been well established and the particulate samples are under measurement. We are now establishing similar method for dissolved form amino acids enantiomers.

新型有机污染物分析
Analysis of Emerging Organic Pollutants By UPLC-ESI-MS/MS

应用超高液相色谱串联四极杆质谱平台开发了五类抗生素 (磺胺类、四环素类、喹诺酮类、大环内酯类、氯霉素类共 20 余种化合物)、内分泌干扰物 (10 种化合物)、药物 (20 余种化合物) 的定性定量快速分析方法，实现各化合物快速分离、捕获、检测，获得较高的灵敏度和较低的检测限。上述方法已稳定应用于长江口水环境新型有机污染物以及生物体内有毒有害物质的检测，用以研究污染物的分布特征、分配机制和消除机理等。
A method for the rapid determination of 20 typical antibiotics by UPLC-ESI-MS/MS in both positive ionization (PI) and negative ionization (NI) mode was established at SKLEC. The targeted organic pollutants include sulfonamides (SFs), tetracyclines (TCs), quinolones (QN), macrolides (MR), chloramphenicols (CPs), typical endocrine disrupting chemicals (EDCs) and other 20 pharmaceuticals. These methods have been applied well in the research of contaminant in Yangtze Estuarine and organism.

多接收电感耦合等离子体质谱仪测定海洋碳酸盐低含量铅同位素组成的方法
Measurement of Trace Lead Isotopic Compositions in Marine Carbonates by MC-ICP-MS

建立和优化了多接收电感耦合等离子体质谱仪测定海洋碳酸盐中低含量铅同位素组成的方法。通过高速微型钻孔平台对来自海南的砗磲样品从内部往外部沿生长线进行了取样，采用以上方法，获得了砗磲样品连续 24 年铅同位素组成的相关数据，并进行了进一步的溯源分析。
We established and optimized the method of determination of low content lead isotope composition in marine carbonate by Multicollector Inductively Coupled Plasma Mass Spectroscopy (MC-ICP-MS). This method has allowed a determination of 24 years lead isotopic composition in tridacna samples collected from Hainan Island, China.

人才培养
Student Programs

2012 年实验室在读的研究生 206 人，其中博士研究生 100 人，硕士研究生 106 人。
There are 206 postgraduate students in SKLEC, including 100 Ph.D. students, and 106 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

2012 年实验室共招收硕士研究生 40 人，博士研究生 26 名，其中直博生 12 人、硕博连读 3 人、留学生 1 人。2012 年共毕业 36 人，其中博士生 14 人，硕士生 22 人，黄德坤、韩旭获得 2012 年上海市优秀毕业生称号。
Sixty-six (66) students were enrolled in 2012, including 26 Ph.D. and 40 M.Sc. Students. Thirty-six (36) students graduated in 2012, among whom, 14 students were awarded Ph.D. degrees and 22 students M.Sc. Degrees. Huang Dekun and Han Xu were honored as Outstanding Graduate Student of Shanghai.

博士毕业生 List of Ph.D. Graduates

自然地理学 /Physical Geography

姓名 Name	导师 Supervisor	毕业论文题目 Thesis	就业单位 Employment
宗纬 Zong Wei	周云轩 Zhou Yunxuan	上海海岸带土地利用 / 覆盖格局变化及驱动机制研究 / Research on Land Use/Land Cover Change and Driving Forces Mechanism in Coastal Zone of Shanghai	上海师范大学 Shanghai Normal University
何为 He Wei	程和琴 Cheng Heqin	珠江河口分汊机制及其对排洪和咸潮上溯的影响—以东三口门为例 /Bifurcated Mechanism and Its Impact on Flood Discharge and Saline Intrusion in Pearl River Estuary	珠江水利科学研究院 Pearl River Institute of Hydraulic Research
蒋陈娟 Jiang Chenjuan	李九发 Li Jiufa	长江河口北槽水沙过程和地貌演变对深水航道工程的响应 / Effects of the Deep Waterway Project on Hydrodynamics, Sediment Dynamics and Morphological Evolution in the North Passage of the Yangtze Estuary	扬州大学 Yangzhou University

姓名 Name	导师 Supervisor	毕业论文题目 Thesis	就业单位 Employment
刘锋 Liu Feng	陈沈良 Chen Shenliang	黄河口及其邻近海域泥沙输运及其动力地貌过程 / Sediment Transport and Dynamic Geomorphology Process in The Yellow River Estuary and its Adjacent Sea	中山大学 (博士后) Postdoctoral Fellow, Sun Yat-sen University
任韧希子 Ren Renxizi	陈沈良 Chen Shenliang	黄河三角洲沉积特征与环境演变研究 / Sedimentary Characteristics and Environment Evolution of the Yellow River Delta	长沙理工大学 Changsha University of Science & Technology

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
潘灵芝 Pan Lingzhi	丁平兴 Ding Pingxing	长江口深水航道整治工程对北槽河床冲淤的影响研究 / Effects of the Deep Waterway Project on Hydrodynamics, Sediment Dynamics and Morphological Evolution in the North Passage of the Yangtze Estuary	国家海洋局东海预报中心 East China Sea Centre of Standard and Metrology, State Ocean Administration of China
李鹏 Li Peng	杨世伦 Yang Shilun	长江供沙锐减背景下河口及其邻近海域悬沙浓度变化和三角洲敏感区冲淤响应 / Variations in Estuarine and Coastal Suspended Sediment Concentration and Delta Accretion/Erosion in Response to Decline in Sediment Supply from the Yangtze River	国家海洋局东海预报中心 East China Sea Centre of Standard and Metrology, State Oceanic Administration of China
史本伟 Shi Benwei	杨世伦 Yang Shilun	长江口崇明东滩盐沼 - 光滩过渡带沉积动力过程研究 / Sediment Dynamic Processes over Transitional Zone of Salt Marsh-Mudflat on Eastern Chongming Island, Yangtze Estuary	南京大学 (博士后) Postdoctoral Fellow, Nanjing University
李路 Li Lu	朱建荣 Zhu Jianrong	长江河口盐水入侵时空变化特征和机理 / Spatial-temporal Dynamic Characteristics of Saltwater Intrusion in the Changjiang Estuary	复旦大学 (博士后) Postdoctoral Fellow, Fudan University
王彪 Wang Biao	朱建荣 Zhu Jianrong	珠江河口盐水入侵 / Salt Intrusion in the Pearl River Estuary	上海环境保护有限公司 Shanghai Environmental Protection Co. Ltd.
黄德坤 Huang Dekun	杜金洲 Du Jinzhou	基于核素示踪的长江口、东海和海南东部近海泥沙的沉降过程 / Applications of Radionuclides to Trace the Source, Transport Pathways and Depositions of Sediments in the Changjiang Estuary, East China Sea and Coastal Environment of East Hainan	国家海洋局第三海洋研究所 Third 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
刘勇 Liu Yong	陆健健 Lu Jianjian	渔业资源抽样调查站点布设方法的理论探讨及海洋捕捞产量抽样估算方法的优良评估 / Theory Study on Station Location Design for Fishery-Independent Survey & Comparison of Sampling and Estimating for Marine Fishing Production Assessment	东海水产研究所 East China Sea Fishery Research Institute, Chinese Academy of Fishery Sciences
何彦龙 He Yanlong	李秀珍 Li Xiuzhen	崇明东滩植被分带模式对生态因子的响应研究 / The Pattern and Dynamic of Plant Community in Yangtze River Estuarine Coastal Salt Marshes: The Response to Environmental Pressure, Interspecies Relationship and Nutrients Retention	国家海洋局南海分局 South China Sea Branch, State Oceanic Administration of China
范学忠 Fan Xuezhong	张利权 Zhang Liquan	崇明东滩基于生态系统的海岸带管理 / Coastal Ecosystem-based Management in Chongming Dongtan	山东理工大学 Shandong University of Technology

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
韩旭 /Han Xu	李道季 /Li Daoji	王腾 /Wang Teng	李道季 /Li Daoji
刘莹 /Liu Ying	张卫国 /Zhang Weiguo	陈炜 /Chen Wei	李九发 /Li Jiufa
塔娜 /Ta Na	程和琴 /Cheng Heqin	李雅娟 /Li Yajuan	杨世伦 /Yang Shilun
王菲菲 /Wang Feifei	程和琴 /Cheng Heqin		

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
陈士谦 /Chen Shiqian	侯立军 /Hou Lijun	路兵 /Lu Bing	蒋雪中 /Jiang Xuezhong
管梅芳 /Guan Meifang	蒋雪中 /Jiang Xuezhong	沈宏 /Shen Hong	沈芳 /Shen Fang

海洋化学 /Marine Chemistry

姓名 /Name	导师 /Supervisor
姜亦飞 /Jiang Yifei	邓兵 /Deng Bing

生态学 /Ecology

姓名 /Name	导师 /Supervisor	姓名 /Name	导师 /Supervisor
陈万逸 /Chen Wanyi	张利权 /Zhang Liquan	孟海星 /Meng Haixing	陆健健 /Lu Jianjian
陈无歧 /Chen Wuqi	李小平 /Li Xiaoping	唐莹莹 /Tang Yingying	李秀珍 /Li Xiuzhen

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
陈燕萍 /Chen Yanping	杨世伦 /Yang Shilun	徐锟 /Xu Kun	朱建荣 /Zhu Jianrong
高钦钦 /Gao Qinqin	朱建荣 /Zhu Jianrong	刘英文 /Liu Yingwen	杨世伦 /Yang Shilun
蒋丰佩 /Jiang Fengpei	何青 /He Qing	徐敏 /Xu Min	李九发 /Li Jiufa

公派留学
Oversea Study Supported by China Scholarship Council

2012 年，实验室共有 5 位学生获公派留学资格，赴荷兰、美国、英国攻读学位或接受联合培养。
Five students received China Scholarship Council scholarships to study abroad (the Netherlands, USA, and UK) for Ph.D. degrees to be afforded either fully by oversea institutions 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
叶雷平 /Ye Leiping	英国 /UK	赫尔大学 /University of Hull
唐莹莹 /Tang Yingying	荷兰 /the Netherlands	内梅亨大学 /Radboud University Nijmegen
王菲菲 /Wang Feifei	荷兰 /the Netherlands	代尔夫特理工大学 /Delft University of Technology
陈炜 /Chen Wei	荷兰 /the Netherlands	乌特勒支大学 /University of Utrecht

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
朱文武 /Zhu Wenwu	李九发 /Li Jiufa	美国 /USA	马里兰大学 /University of Maryland

海外研修
Oversea Visiting

2012 年，实验室有 6 位同学赴加拿大、瑞士、德国、美国、英国进行交流访学。
Six students went abroad (Canada, Germany, Denmark, and USA) as visiting students.

姓名 /Name	访学单位 /Visiting institute	起止时间 /Date
路兵 /Lu Bing	加拿大多伦多大学 /University of Toronto, Canada	2011.03.27-2012.03.27
鲍红艳 /BaoHongyan	瑞士苏黎世联邦理工学院 /Eidgenössische Technische Hochschule Zürich (ETH), Switzerland	2011.09.13-2012.03.13
姜冰冰 /Jiang Bingbing	美国俄亥俄州立大学 /Ohio State University, USA	2011.10.21-2012.10.21
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
季韬 /Ji Tao	德国 2012 年中德海洋暑期培训班 /2012 Sino-German Summer School, Germany	2012.09.09-2012.09.22
董辰寅 /Dong Chenyin	英国利物浦大学 /University of Liverpool, UK	2012.09.21-2012.12.21

研究生科研成果
Research Achievements by Graduate Students

2012 年研究生发表第一作者论文 67 篇，占实验室第一作者论文总数的 62.3%，其中 SCI/SCIE 论文 22 篇 (II 区文章 4 篇)，占实验室 SCI/SCIE 论文的 42.3 %。实验室学生中有 1 人次参加国际学术会议，并作口头报告。
The graduate students published 67 papers as first authors, among which 22 papers were published in SCI/SCIE journals. One students attended international conferences with 1 oral presentation.

公众服务
Outreaches

为促进优秀大学生之间的学术交流，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“2012 年河口海岸学全国优秀大学生夏令营”于 2012 年 7 月 16 日至 20 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，共有来自全国十余所高校的 29 名优秀大学生参加本次夏令营。
Under the guide of East China Normal University, SKLEC hosted Excellent Students' Summer School of Estuarine and Coastal Science during 16th -20th July, 2012. After recommendation from universities and SKLEC's selection, finally, there were 29 excellent students participated in this summer school.

教学委员会
主　任：何　青
副主任：张卫国
委　员：丁平兴、李道季、杜金洲、沈芳、周云轩、戴志军、袁琳

SKLEC Education Committee
Chair: Prof. He Qing
Deputy Chair: Prof. Zhang Weiguo
Members: Prof. Ding Pingxing, Prof. Li Daoji, Prof. Du Jinzhou, Prof. Shen Fang, Prof. Zhou Yunxuan, Prof. Dai Zhijun, Dr. Yuan Lin

研究队伍
Faculty and Staff

- 2012 年重点实验室引进 3 人，现有固定人员 59 人 (其中研究人员 49 人，技术人员 8 人，管理人员 2 人)。
  Three members joined SKLEC in 2012. There are 59 fulltime members, including 49 academic research members, 8 technical members and 2 administrative members.
- 重点实验室客座教授王正兵入选教育部“长江学者奖励计划”讲座教授。
  Adjunct Prof. Wang Zhengbing was funded by the Changjiang Scholar Program as a Chair Professor by Ministry of Education (MOE) of China.
- 重点实验室客座教授章可奇入选“上海千人计划”。
  Adjunct Prof. Zhang Keqi was funded by the Shanghai Recruitment Program of Global Experts (also named Thousand Talents Program of Shanghai) that is organized by Shanghai Municipal Government.
- 陈中原教授入选“上海领军人才”。
  Prof. Chen Zhongyuan was admitted to the Shanghai Leading Talent Program.
- 戴志军和程金平教授入选教育部“新世纪优秀人才支持计划”。
  Prof. Dai Zhijun and Cheng Jinping were admitted to the New Century Excellent Talent Program supported by the Ministry of Education (MOE) of China.

研究团队
Research Clusters

实验室设立了“水沙动力学和工程应用中心”等 7 个研究团队。
SKLEC consists of seven research centers.

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, HouLijun, 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
遥感与地理信息研究中心 Center for Remote Sensing and Geoinformatics	主任：沈芳 成员：周云轩、蒋雪中、Leonid Sokoletsky、田波 Director: Shen Fang Members: Zhou Yunxuan, Jiang Xuezhong, Leonid Sokoletsky, Tian Bo

* 兼职人员 / Adjunct members

固定人员
Faculty and Staff

教授 Professors

姓名 Name	研究专长 Research Interests	Email
陈吉余 院士 Chen Jiyu Academician of CAE	河口海岸 Estuarine and Coastal Research	jychen@sklec.ecnu.edu.cn
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副教授 Associate Professors

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葛振鸣 Ge Zhenming	气候变化与生态系统碳过程；生态模型；湿地生态学 Climate Change & Ecosystem Carbon-process; Ecological Model; Wetland Ecology	zmge@sklec.ecnu.edu.cn
蒋雪中 Jiang Xuezhong	河口海岸遥感与 GIS 应用；河口海岸变化及其人类活动响应 Remote Sensing & GIS, Their Applications in Coastal and Estuarine Area; Coastal and Estuarine Change and Its Response of Human Activity	xzjiang@sklec.ecnu.edu.cn
Leonid Sokoletsky	内陆和近海水域光学模型；卫星水质监测 Ocean and inland waters optical model; Satellite water quality monitoring	sokoletsky.leonid@gmail.com
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郑亮 Zheng Liang	水生生物分子遗传学；环境毒理基因组学、转录组学及蛋白质组学 Molecular Genetics in Aquatic Life; Genomics, Transcriptomics and Proteomics for Environmental Toxicology	lzheng@sklec.ecnu.edu.cn
韦桃源 师资博士后 Wei Taoyuan Postdoctoral Fellowship	水动力与地貌过程；沉积物运移 Hydro Dynamics and Morphological Processes; Sediment Transport; Gravity Currents	tywei@sklec.ecnu.edu.cn

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姓名 Title	技术专长 Technical Expertise	姓名 Title	技术专长 Technical Expertise
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顾靖华　工程师 Gu Jinghua, Engineer	野外仪器设备 Field Surveying Instrument	张国森　工程师 Zhang Guosen, Engineer	有机及无机分析 Organic and Inorganic Analysis
张文祥　高级工程师 Zhang Wenxiang, Senior Engineer	野外仪器设备 Field Surveying Instrument	邓　鸿　助理工程师 Deng Hong, Assistant Engineer	生物分析 Biological Analysis
薛　云　助理工程师 Xue Yun, Assistant Engineer	无机分析 Inorganic Analysis	张　婧　技术员 Zhang Jing, Technician	有机分析 Organic Analysis

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国际期刊、组织任职
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-
	IGBP/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
陈吉余 Chen Jiyu	Acta Oceanologica Sinica	Editorial board member	2003-
丁平兴 Ding Pingxing	Estuarine Coastal and Shelf Science	Editorial board member	2005-2012.9
	Acta Oceanologica Sinica	Editorial board member	2003-
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-
	Acta Oceanologica Sinica	Editorial board member	2003-
陈中原 Chen Zhongyuan	Geomorphology	Editorial board member	2001-
	Estuarine Coastal and Shelf Science	Editorial board member	2009-
陆健健 Lu Jianjian	Ecological Engineering	Editorial board member	2008-
李秀珍 Li Xiuzhen	Ecological Engineering	Editorial board member	2008-
	Journal of Conservation Planning	Editorial board member	2001-
	Chinese Geographical Science	Editorial board member	2009.6-
	Wetlands Ecology and Management	Editorial board member	2012.8-
周云轩 Zhou Yunxuan	Ocean & Coastal Management	Editorial board member	2011-2015
周俊良 Zhou Junliang	Sciences in Cold and Arid Regions	Editorial board member	1997-
	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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