Recommendations of the ASEAN – China Workshop on Marine Science and Technology Cooperation
Bali, Indonesia, 21-22 November 2013

---

1. ASEAN – China Workshop on Marine Science and Technology Cooperation was held in Bali, Indonesia on November 21 – 22, 2013 as part of the Work Plan of the Implementation of theDeclaration on the Conduct of Parties in the South China Sea (DOC) for 2013-2014. This workshop was hosted by State Oceanic Administration (SOA) China, Ministry of Marine Affairs and Fisheries (MMAF), Indonesia, Ministry of Foreign Affairs (MFA), Indonesia and organized by the First Institute of Oceanography, the Agency for Marine & Fisheries Research and Development, Ministry of Marine Affairs and Fisheries of the Republic of Indonesia (MMAF), and the Directorate General for ASEAN Cooperation of the Ministry of Foreign Affairs of the Republic of Indonesia (MFA). This workshop was also co-partnered by the Intergovernmental Oceanography Commission Sub-Commission for the Western Pacific (IOC-WESTPAC). It was attended by representatives of ASEAN Member States and China, including invited resource speakers, scientists and scholars. The list of participants appears as **Annex I**.

2. The workshop provided a forum for discussion among researchers, experts and government officials of ASEAN Member States and China to discuss five topics namely: ocean and climate change, ocean forecasting system and observation, marine environment and biodiversity, marine records on environment and climate change, and ocean economy and marine policy. The abstracts of presentations appear as **Annex II**.

3. The workshop shared common interests and concerns among others: ocean forecasting system (OFS) and disaster mitigation, marine endangered species and ecosystem conservation, climate change, ocean based economic development, and marine pollution and rehabilitation. It underscored the importance of promoting collaborative research and development activities in marine science and technology between ASEAN Member States and China. It is believed that better scientific understanding of the aforementioned challenges will promote better understanding among ASEAN Member States and China especially in ocean related issues and support the economic development in the Southeast Asia region and China.

4. In the spirit of enhancing Marine Science and Technology Cooperation, the workshop:

a. encouraged to develop marine cooperation initiatives to strengthen marine knowledge including capacity building, service and innovation for next decade, promote partnership to mainstream marine cooperation, improve communication to share policy and knowledge, enhance protection to conserve ecosystem, provide services to meet the needs of community, and develop ocean economy through sustainable and social capital innovation. This can be done in consultation with China and relevant ASEAN led mechanisms and bodies.

b. expected further collaborative research and development activities on marine science and technology among ASEAN Member States and China, including the making use of the ASEAN China Maritime Cooperation Fund.

c. noted China's suggestion to establish partnership mechanism among marine research institutes and universities to evaluate collaborative research and development activities in marine science and technology cooperation among ASEAN Member States and China.

d. welcomed the proposal to convene regular workshops among ASEAN Member States and China to promote ocean research and development related issues in consultation with ASEAN Member States.

5. It is agreed that the next workshop will be hosted by **Thailand** and the following workshop will be hosted by **Malaysia**.

ANNEX I.
LIST OF PARTICIPANTS

Country	No	Title	First Name	Family Name	Affiliation
Brunei	1	Mr	Akmal Zakhwan	Aji	Ministry of Foreign Affairs and Trade Brunei Darussalam
Brunei	2	Ms	Siti	Arnyfariza Jaini	Ministry of Foreign Affairs and Trade Brunei Darussalam
Cambodia	3	Mr.	Chea	Leng	Division of Coastal Natural Resources and Marine Environmental Management, Ministry of Environment
Cambodia	4	Mr.	Park	Visal	Administration Division and Project Coordinator of Integrated Coastal Management
Cambodia	5	Mr.	Sem	Sundara	Head of Department of International Cooperation and ASEAN Affairs, Ministry of Environment of the Kingdom of Cambodia
China	6	Mr.	Antao	Wang	Department of International Cooperation, State Oceanic Administration
China	7	Mr.	Baochao	Liu	Department of International Cooperation, State Oceanic Administration
China	8	Mr.	Chun-Feng	Li	Tongji University
China	9	Mr.	Dongfeng	Xu	Second Institute of Oceanography
China	10	Mr.	Douding	Lu	Second Institute of Oceanography
China	11	Mr.	Fangli	Qiao	First Institute of Oceanography, SOA, China
China	12	Mr.	Haoche	Ho	Zhejiang University
China	13	Mr.	Jianming	Chen	Third Institute of Oceanography
China	14	Mr.	Jun	Chu	Deparment of Marine Environmental Forecasting, SOA

China	15	Mr.	Lei	Zhou	Mission of People's Republic of China to ASEAN
China	16	Mr.	Lin	Liu	Center for Ocean and Climate Research, FIO, SOA, China
China	17	Mr.	Liu	JianQiang	National Satellite Ocean Application Service
China	18	Mr.	Peng	Zhao	North China Sea Branch of State Oceanic Administration
China	19	Mr.	Rongcheng	Lin	Third Institute of Oceanography
China	20	Mr.	Sengfa	Liu	Lab of Marine Geology and Geophysics, FIO, SOA, China
China	21	Mrs	Wei	Zheng	Center for International Cooperation, FIO, SOA, China
China	22	Ms	Xiaohui	Wang	National Marine Data and Information Service
China	23	Mr	Xuefa	Shi	Lab of Marine Geology and Geophysics, FIO, SOA, China
China	24	Mr	Xuelei	Zhang	Center for Marine Ecology Research, FIO, SOA, China
China	25	Ms	Yang	Liu	National Marine Environmental Forecasting Center
China	26	Mr	Yanxiong	Liu	Center for Island & Coastal Zone Research, FIO, SOA, China
China	27	Mr	Zhanhai	Zhang	Department of International Cooperation, State Oceanic Administration
China	28	Mr	Zhongjun	Ma	Zhejiang University
Indonesia	29	Mr	Achmad	Poernomo	Agency for Marine and Fisheries Research and Development (AMFRD), Ministry of Marine Affairs and Fisheries
Indonesia	30	Mr	Agung	Purnomo	Agency for Marine and Fisheries Research and Development (AMFRD), Ministry of Marine Affairs and Fisheries

Indonesia	31	Mr	Agung Dhamar	Syakti	Fisheries and Marine Science Department, Faculty of Sciences and Technology, University of Jenderal Soedirman
Indonesia	32	Mr	Aluh	Nikmatullah	Laboratorium Immunobiology, University of Mataram
Indonesia	33	Ms	Anastasia Rita Tisiana Dwi	Kuswardani	Research and Development Center for Marine and Coastal Resources, AMFRD, Ministry of Marine Affairs and Fisheries (MMAF)
Indonesia	34	Mr	Andreas A	Hutahaean	Research Group on Blue Carbon, Research and Development Center for Marine and Coastal Resources, MMAF
Indonesia	35	Ms	Anisa	Suspita	
Indonesia	36	Ms	Avi Dewani Sari	Harahap	Ministry of Foreign Affairs (MFA), Indonesia
Indonesia	37	Mr	Budi	Sulistiyo	Research and Development Center for Marine and Coastal Resources, AMFRD, Ministry of Marine Affairs and Fisheries (MMAF)
Indonesia	38	Ms	Dian	Pitaloka	Research and Development Center for Marine and Coastal Resources, AMFRD, Ministry of Marine Affairs and Fisheries (MMAF)
Indonesia	39	Mr	Dicky	Fabrian	Ministry of Foreign Affairs (MFA), Indonesia
Indonesia	40	Mr	Eko	Triyarso	Research and Development Center for Marine and Coastal Resources, AMFRD, Ministry of Marine Affairs and Fisheries (MMAF)
Indonesia	41	Ms	Erlina	Widiyaningsih	Ministry of Foreign Affairs (MFA), Indonesia
Indonesia	42	Mr	Ibrahim	Adjie	Ministry of Foreign Affairs (MFA), Indonesia
Indonesia	43	Mr	Iskandar	Zulkarnaen	Focal Point for Intergovernmental Oceanographic Commision (IOC), Indonesia
Indonesia	44	Ms	Mariska	Astrid	Research and Development Center for Marine and Coastal Resources, AMFRD, Ministry of Marine Affairs and Fisheries (MMAF)
Indonesia	45	Ms	Melissa Yuanita	Repi	Ministry of Foreign Affairs (MFA), Indonesia

Indonesia	46	Mr	Ngurah	Wiadnyana	Research and Development Center for Marine and Fisheries Technology, MMAF
Indonesia	47	Mr	Rainer	Louhanapessy	Minister Counsuller PTRI ASEAN
Indonesia	48	Mr	Rainer A.	Troa	Research and Development Center for Marine and Coastal Resources, AMFRD, Ministry of Marine Affairs and Fisheries (MMAF)
Indonesia	49	Ms	Ratna	Ningsih	Ministry of Foreign Affairs (MFA), Indonesia
Indonesia	50	Ms	Risha Jilian	Chaniago	Ministry of Foreign Affairs (MFA), Indonesia
Indonesia	51	Mr	Satya	Pratama	Center of Analysis for International and Institutional Cooperation, MMAF
Indonesia	52	Mr	Sophia	Sagala	Research and Development Center for Marine and Coastal Resources, AMFRD, Ministry of Marine Affairs and Fisheries (MMAF)
Indonesia	53	Mr	Subandono	Diposaptono	Directorate of Spatial Planning for Ocean, Coastal and Small Islands, MMAF
Indonesia	54	Mr	Sugiarta	Wirasantosa	Research and Development Center for Marine and Coastal Resources, AMFRD, Ministry of Marine Affairs and Fisheries (MMAF)
Indonesia	55	Mr	Sunarpi		Laboratorium Immunobiology, University of Mataram
Indonesia	56	Mr	Triyono		Research and Development Center for Marine and Coastal Resources, AMFRD, Ministry of Marine Affairs and Fisheries (MMAF)
Indonesia	57	Mr	Tukul Rameyo	Adi	Research and Development Center for Marine and Coastal Resources, AMFRD, Ministry of Marine Affairs and Fisheries (MMAF)
Indonesia	58	Mr	Widodo Setiyo	Pranowo	Research and Development Center for Marine and Coastal Resources, AMFRD, Ministry of Marine Affairs and Fisheries (MMAF)
Indonesia	59	Mr	Zildan	Azmiwidiar	Ministry of Foreign Affairs (MFA), Indonesia
Indonesia	60	Mr	Viv Djanat	Prasita	University of Hangtuah, Surabaya

Indonesia	61	Mr	Saroso		Indonesian Hydro-Oceanographic Office
Indonesia	62	Mr	Tri Nuke	Pudjiastuti	Indonesian Institute of Science
Indonesia	63	Ms	Yani	Permanawati	Research and Development Center for Marine Geology, Ministry of Energy and Mineral Resources, Indonesia
Indonesia	64	Mr	Dwi	Susanto	Indonesia
Indonesia	65	Mr	Boy	Darmawan	Ministry of Foreign Affairs (MFA), Indonesia
Indonesia	66	Ms	Rina	Zuraida	Research and Development Center for Marine Geology, Ministry of Energy and Mineral Resources, Indonesia
Indonesia	67	Mr	Agus	Setiawan	Institute for Marine Research and Observation, MMAF, Indonesia
Indonesia	68	Mr	Ibnu	Sofian	Geospatial Information Agency
Indonesia	69	Mr	Antonius	Wijanarto	Geospatial Information Agency
Lao PDR	70	Mr	Chatoulong	Boasisavath	Director APSC Division, ASEAN Department, Ministry of Foreign Affairs of Lao PDR
Lao PDR	71	Ms	Dongdavanh	Sibounthong	Fisheries Resources Section, Deparment of Livestock and Fisheries, Ministry of Agriculture and Forestri Vientiane capital, Lao PDR
Malaysia	72	Mr	Azizan	Abu Samah	Institute of Ocean and Earth Sciences, University of Malaysia
Malaysia	73	Mr	Azwarina Mohd Azmi	Ramasamy	South China Sea Repository & Reference Center, Institute of Oceanography & Environment (INOS), University of Malaysia Terengganu
Malaysia	74	Mr	Che Abd Rahim	Mohamed	Marine Geo-Radiochemistry, School of Environmental & Natural Resources Sciences, Faculty of Science & Technology, University of Kebangsaan Malaysia
Malaysia	75	Ms	Chui Wen	Bong	Institute of Ocean and Earth Sciences, University of Malaysia

Malaysia	76	Mr	Fredolin	Tangang	School of Environmental and Natural Resource Sciences, UKM
Malaysia	77	Ms	Mary	Matthews	Institute of Ocean and Earth Sciences, University of Malaysia
Malaysia	78	Mr	Mohammed Rizman	Idid	Institute of Ocean and Earth Sciences, University of Malaysia
Malaysia	79	Mr	Siew Moi	Phang	Institute of Ocean and Earth Sciences, University of Malaysia
Myanmar	80	Mr	Chit	Kyaw	Deparment of Meteorology and Hydrology, Ministry of Transport
Philippines	81	Ms	Jo Marie V	Acebes	Ateneo de Manila University, and Balyena.org
Philippines	82	Mr	Josel Nivera	Mostajo	Office of the Presidential Spokesperson - Department of Foreign Affairs
Philippines	83	Mr	Noel	Novicio	Permanent Mission of the Philippines to ASEAN
Singapore	84	Dr	Karenne	Tun	Coastal & Marine, National Biodiversity Center, National Parks Board
Thailand	85	Ms	Narumol	Kornkanitnan	Marine and Coastal Resources Research Center (Upper Gulf of Thailand) Department of Marine and Coastal Resources, Thailand
Thailand	86	Mr	Somkiat	Khokiattiwong	Chairperson of IOC/WESTPAC, Phuket Marine Biological Center
Thailand	87	Mr	Ukkrit	Satapoomin	Phuket Marine Biological Center
Vietnam	88	Mr	Hong Long	Bui	Institute of Oceanography, Chairman of Vietnam National IOC Committee (IOC)
Vietnam	89	Mr	Nguyen Van	Lap	Institute of Resources Geography, Vietnam Academy of Science and Technology

ANNEX II.
ABSTRACTS

The impact of climate change on main oceanographical characteristics in Vietnam sea and Bien Dong (SCS) and some issues on future cooperation

Hong Long Bui

Chairman of IOC Vietnam, Senior reseacher, Institute of Oceanography,
Vietnam Academy of Science and Technology
01 Cau Da, Nha Trang, Vietnam
Email: buihonglongion@gmail.com

Abstract

Bien Dong (SCS) is the fourth largest marignal sea (after Philippine, Coral and Arabian Seas) and part of the Parcific Ocean, with an area of about 3,500,000 km²
The oceanographical characteristics (hydrodynamic, water environment...) of Bien Dong are dominated mainly by:

- Large-scale atmospheric circulation systems (espcially the northeast-southwest monsoon system).
- Current systems and water exchange (tides and regular current systems…) through the Luzon, Taiwan straits in the North, Singapore and Malacca straits in the South, Mindanao and Babalac in the East.
- Bien Dong temparature balance (radiation, absorption…)
- Natural disasters

All these are related to the climate change. Recently, storms, floods, droughts, bank erosion, open/closed estuaries, upwelling changes, red tides etc. happened with increasing frequency in the Vietnamese coastal area and caused serious impacts on the national social economy.
In this forum, we Would like to exchange cooperation suggestions and ideas on scientific research and capacity development (human resource, equipments, facilities…), especially on information sharing, transfer of research results, buiding collaboration network…, to simulate and forecast such disasters to minimize their impacts for sustainable economic development, not only in the Vietnamese coastal area, but also in other countries in the region.

Monsoon Onset Monitoring and Its Social and Ecosystem Impacts (MOMSEI)

Weidong Yu and Somkiat Khokaittiwong

Abstract

MOMSEI is one pilot project of Southeast Asian Global Ocean Observing System (SEAGOOS), which operate under framework of UNESCO-IOC Sub-commission for Western Pacific (IOC-WESTPAC), since 2009. As the summer monsoon plays an importance role on livelihood of people in the Southeast Asian,its higher(lower) precipitation could lead to drought (flood) and finallyimpactson the crop production. MOMSEI's initiate concept is to understand the mechanism leading to the earliest summer monsoon onset over Bay of Bengal (BoB), particularly the role of the high sea surface temperature (SST) in central BoBaround from mid of March to late of April. This understanding could provide direct application in the seasonal outlook. The project also provides capacity building for young scientists and builds up research network for climate in this region. Numerous activities have been carrying out since its inauguration through the active collaboration among the participating countries such as China, Thailand, Myanmar, Malaysia, and Indonesia. Seven cruises were conducted in AndamanSea, Bay of Bengal and Equatorial Southeastern Indian Ocean. The data from the cruises and other existing ocean observing systems, such as RAMA/IndOOS, are analyzed, which reveals the critical processes leading to the earliestabrupt monsoon onset over Bay of Bengal. Also, several interesting oceanic response to the boreal summer monsoon onset forcing, such as the upwelling, were identified.

After 4 years of intensive pilot research, MOMSEI now gains much clearer and enriched science picture on monsoon and its interaction with the oceanic process. The project is therefore ready to expand itsscope to include the winter monsoon and other related oceanographic and climatic processes, such as upwelling in eastern Indian Ocean, seasonal outlook of monsoon onset, physical-biogeochemical interaction, etc., in the second phase. MOMSEI is transferring from its pilot study to the full operation phase in 2015 onwards, which calls for more broad and in-depth regional cooperation.

MOMSEI Research Activities To Support National Food Security Program

Widodo S. Pranowo[1*)], Tukul R. Adi[1], Budi Sulistiyo[1], Weidong Yu[2], Liu Lin[2], & Somkiatt Khokiattiwong[3]

[1]Research & Development Center for Marine & Coastal Resources, Agency for Marine & Fisheries Research & Development, Ministry of Marine Affairs & Fisheries The Republic of Indonesia
[2]The First Institute of Oceanography, State Oceanic Administration, People's Republic of China
[3]Phuket Marine Biodiversity Center, Thailand
[*)]Email : widodo.pranowo[at]kkp.go.id; widodo.pranowo[at]gmail.com

Abstract

MOMSEI, a Monsoon Onset Monitoring and Its Social and Ecosystem Impacts, is a research project under South-East Asia Global Ocean Observing System (SEAGOOS) Project of the Inter-governmental Oceanographic Commission Sub Commission West Pasific (IOC-WESTPAC) as a flagship. There are now two bilateral platforms, a MOMSEI of Thailand – China, and a MOMSEI of Indonesia – China. Two cruises in west Sumatra Sea part of Eastern Indian Ocean had been succefully made in 2011 and 2012. A new momentum of MOMSEI Indonesia – China, to support the national action plan for climate change adaptation for 2013 - 2016, is signed at June 2013. The presentation shows the role of MOMSEI to supporting the national food security program in relation with the masterplan of acceleration and expansion of Indonesian economic development. Several campaign in national, regional and international has been made. Examples of winter monsoon, impact to fishing activitiy in South Java Sea and also impact to the salt production in Northern coastal of Java including madura, are also presented in here. RATU, a seasonal-peRmanent of jAva coasTal Upwelling, is a proposed name for java upwelling phenomenon, is first time declared in this workshop.

Keyword(s):
MOMSEI, Food Security, Indonesia, China, Thailand, RATU, java upwelling

The recent progress for the tropical Indian Ocean observation and research activities

Lin Liu*), Weidong Yu, Huiwu Wang, Yanliang Liu,
Kuiping Li, and Chunlin Ning

The First Institute of Oceanography, State Oceanic Administration
Qingdao 266061, China
*)E-mail: liul@fio.org

Abstract

Associated with the joint effort from China and parts of ASEAN countries, obvious progresses had been made during last several years in the tropical Indian Ocean. In this presentation, we reviewed the recent progresses in observation and research activities aspects. For the observation, China made the contribution to RAMA project with the joint effort from Indonesia and Thailand, which aims to increase the ability of Asian monsoon real time monitoring and predictability skill. For the research activities, the tropical Indian Ocean variability from intra-seasonal to seasonal time scale had been paid special attention. The important role of Bay of Bengal sea surface temperature on the Asian summer monsoon onset had been identified and the role from the. Further more, based on the CMIP models, the simulated Indian Ocean Dipole mode event had been evaluated and assessed for the future projection.

The observation of Zhe-Ming Coastal Current and its influence on the environment of the Zhejiang Coast

Dongfeng Xu[*)], Jun Wang, Mingquan Xu, Hong Chen, Pengfei Shi

Second Institute of Oceanography, State Oceanic Administration
Hangzhou,310012,China
[*)]E-mail:xudongfengyh@yahoo.com

Abstract

The historical observation shows that there is a southward current (ZMCW: Zhe-Ming Costal Current) along the Zhejiang coast in winter which brings low salinity Yangtze River Diluted water to the coast. Outside the ZMCW there is a famous Taiwan Warm Current (TWC), which flows northward all the year round. While in summer the TWC influence the coastal bay of Zhejiang and brings the high salinity water. Our field observation and analyzing show that the ZMCW developed from autumn and retreated in spring. The ZMCR changes synoptically which is control by Kevin wave theory. A half year ADCP data from a mooring Bouy station near Zhujiajian Islands show that the residual current is southward from March till November. This means that the TWC cannot enter into Hangzhou Bay in summer. So the northern limitation of the high salinity water brought by the TWC is outside the Hangzhou Bay (30N) in summer. A numerical modeling result by FVCOM is also used to study the reason.

Impacts of ocean acidification on marine biodiversity and coastal communities: Gaps and potential research collaboration

Siew-Moi Phang

Institute of Ocean and Earth Sciences (IOES),
University of Malaya, 50603 Kuala Lumpur, Malaysia
E-mail: phang@um.edu.my

Abstract

Ocean acidification, linked to increased carbon emissions, is a global environmental problem that will have significant impacts on the marine environment and the coastal communities. Over the last 30 years, a decrease of 0.02 pH units per decade in the oceans, has been recorded. The effects of ocean acidification on marine species and ecosystems are variable and complex, impacting developmental and adult phases differently across species. Notable impacts include reduced calcification of corals, altered physiological, metabolic and reproductive processes, and even migration of marine organisms, resulting in reduced ocean productivity. These may cause significant socioeconomic impacts, especially on coastal and maritime communities and industries dependent on the oceans for important services and goods. In Southeast Asia, important coastal and marine economic activities include fisheries, aquaculture and tourism, with use of marine algae as feedstocks for biofuel and for carbon sequestration gaining great interest. The security of benefits from these marine ecosystem services depends on the resilience of marine habitats and biota to climate change, including ocean acidification. However knowledge is scarce and prediction of impacts is highly debatable, but the answer lies in understanding the mechanisms of response and adaptation of marine species. It is therefore imperative to investigate the following to ensure security of societal benefits from marine resources; i) pH and seawater chemistry changes in habitats in response to elevated CO_2 levels; ii) response and tolerance of commercially & ecologically important marine species to pH/CO_2 changes, to identify the tipping points; iii) innovative technology to ensure sustainable benefits and habitat protection under future climate. This will be discussed with examples of research conducted at the University of Malaya.

Development of Indonesian Ocean Forecasting System (InaOFS)

Dr. A. Rita Tisiana Dwi Kuswardani

Research and Development Center for Marine and Coastal Resources
Agency for Marine and Fisheries Research and Development
Ministry of Marine Affairs and Fisheries
The Republic of Indonesia

Email : anastasia.tisiana@gmail.com

Abstract

The Indonesian region, also known as the “Maritime Continent”, has a complex system of islands, narrow peninsula and complicated coastal geometries. There are some major oceanic and atmospheric forcing affecting the Indonesia region. The strongest is ENSO, and then Indian Ocean Dipole, Monsoon, Madden Julian Oscillation (MJO), coastally trapped Kelvin waves from the Indian Ocean and Rossby waves from the Pacific in sequence. Due to complicated topography and coastal geometries, the tidal system in the Indonesian seas is the most complex all over the world.

Marine activities in Indonesia region consist of fisheries activity, oil and natural gas exploration, transportation, and maritime security. An ocean forecast system in this region would be helpful to support of safe and efficient navigation, emergency responses, fisheries zone management and environmentally sound management of coastal zones.

The forecasts are generated by numerical models, which are customized to simulate and predict the Indonesian sea features realistically. Some models have been developed by some institutions, such as: atmospheric models (MM5, WRF) ,wave models, ocean models, coupled atmospheric-wave models , and coupled wave-ocean models.

Joint efforts and coordination among Indonesia's research institutes and universities are required to achieve the development of Indonesia Ocean Forecasting System (InaOFS). The project goals need to be tailored to meet the needs of the participants of the project.

A multi-institutional effort, hereafter known as InaOFSconsortium, develop InaOFSmodel. The consortium members are Agency for Marine and Fisheries Research and Development (AMFRD), Geospatial Information Agency (BIG), Agency for the Assessment and the Application of Technology (BPPT), and university (ITB). Research and Development Center for Marine and Coastal Resources, AMFRD, Ministry of Marine Affairs and Fisheries would responsible to coordinating the project.

IOFS consortium will focuses on Indonesia region 90 – 150 E, 15 N – 15 S. The 1st plan of consortium are developing atmospheric model WRF – MASNUM wave model and compare with existing coupled model (MM5-Wavewatch III and WRF-Wavewatch III), running global model (HYCOM or ROMS) for forcing the regional model (Indonesian sea) and developing ocean model (POM) and others (ROM, HYCOM) to be coupled with atmospheric and wave model. For testing the accuracy and reliability of the model products, satellite and in-situ measurements will be used for the purpose of validation

Wave climate simulation at the east coast of Peninsular Malaysia

Fredolin Tangang[*)], Ali Mirzaei, Liew Juneng

Research Centre for Tropical Climate Change System,
Faculty of Science and Technology
The National University of Malaysia, 43600, Bangi, Selangor, MALAYSIA
[*)]E-mail: tangang@ukm.my

Abstract

This study investigates long-term variability and wave characteristics along the east coast of Peninsular Malaysia. We implemented the state-of-the art WAVEWATCH III spectral wave model to simulate a 31- year wave hindcast (1979-2009) which the domain covered the entire South China Sea. The simulations were validated with satellite altimeter and a limited 3 months Acoustic Wave and Current (AWAC) directional wave data recorded nearshore at Terengganu (102.92° E and 5.5° N). In this paper we analyze the long-term variability and wave characteristics along the east coast of Peninsular Malaysia by selecting nice locations. Significant wave height (H_s) is seasonally dependent with highest and lowest values occur during winter and summer seasons, respectively. Additionally, the H_s amplitudes also show inter-annual variability during the 31 years period. Also, the H_s amplitudes tend to be higher at the northern section of the coast and gradually decrease southward. This is due to the direct exposure to long fetch. In the southern section of the coast, island blockage play a dominant role in reducing the wave amplitudes.

Redefining the South East Asia Center for Ocean Research and Monitoring (SEACORM)

Agus Setiawan

Institute for Marine Research and Observation
Agency for Marine and Fisheries Research and Development
Ministry of Marine Affairs and Fisheries of Republic of Indonesia
E-mail: setiawan.agus@gmail.com

Abstract

In order to create a prime mover on research and monitor of Indonesian oceans, Ministry of Marine Affairs and Fisheries has established South East Asia Center for Ocean Research and Monitoring (SEACORM) in 2003. As a center for ocean research and monitoring, SEACORM may has an advantage to support the national program on developing a National Marine Data Center (NMDC) and also support the Indonesia Global Ocean Observing System (INA-GOOS), an Indonesian node of the Global Ocean Observing System (GOOS). The vision of INA-GOOS it self is to have prosperity for the Indonesia and to enhance a better life for the international community through the understanding of Indonesia and its surrounding ocean. Meanwhile, the mission of INA-GOOS is to set up a comprehensive monitoring and its prediction skill of the ocean and its interaction with the atmosphere in the Indonesian waters and the surrounding oceans.

Since its first establishment, SEACORM as a supporting institute for INA-GOOS was trying to implement an operational oceanography by combining remote sensing and in-situ measurement data with numerical model to predict the ocean state and dynamics of Indonesian seas. One of its products that has been fully operational is fishing ground map that covers 11 Fishing Management Areas (FMA) of Indonesia. Further development of SEACORM to become a real center for ocean research and monitoring for ASEAN countries is still continued now in order to keep its trackby implementing an Infrastructure Development of Space Oceanography (INDESO) Project that consists of 3 cores, i.e. satellite receiving station, ocean numerical models, and dissemination portal. This system will fully support the development of Ocean Forecast System (OFS) in Indonesia and will improvethe management of Indonesian marine resources.

Keywords: INA-GOOS, GOOS, ocean forecast system, operational oceanography, ocean research and monitoring

The ocean satellite and application in China

Jianqiang Liu*), Xingwei Jiang, Mingsen Lin

National satellite ocean application service, Beijing, 100081, China
*)E-mail: jqliu@mail.nsoas.gov.cn

Abstract

The function of ocean color detecting and experimental operation application is validated successfully by the first Chinese ocean color satellite (HY-1A). The transition from experimental application to operational service is come true by the second Chinese ocean color satellite (HY-1B). A new era of global ocean dynamic environment monitoring in all-weather and all-time is opened by the first Chinese ocean dynamic satellite (HY-2A). Though three five-year's plan unremittingly efforts since nine-five plan, China's ocean satellite start from scratch, from single to form a series, from single type to multi spectrum, from the exploratory to application, and it is going to operational and the series. The ocean satellite products cover China's offshore and global ocean. The quantitative level is gradually improved. Service area has been expanded. Ocean stereo monitoring capability are upgrading, it is provided effective, strong and orderly technical support for the development of China's marine industry.

Introduction of the Chinese Global Operational Oceanography Forecasting System in the National Marine Environmental Forecasting Center

Hui Wang, Zhanggui Wang, Liying Wan and Yang Liu[*)]

National Marine Environmental Forecasting Center
Beijing 100081, China
[*)]E-mail: liuyang@nmefc.gov.cn

Abstract

The National Marine Environmental Forecasting Center (NMEFC) is a branch of the State Oceanic Administration (SOA), People's Republic of China. The primary functions of the Center are marine environmental forecasting, marine disaster forecasting and warning, and operational management. The NMEFC publishes numerous marine forecasting products regarding ocean waves, storm surges, tsunamis, red tides, sea ice, ocean currents, sea temperature, El Niño patterns, beach forecasting, oil spills, sea level, and marine weather.

Over the past five years, the NMEFC has been making great efforts in developing an operational oceanography forecasting system with global coverage and regional zooms. Recently, the system successfully turned to operational phase and was named as the first version of the Chinese Global operational Oceanography Forecasting System (CGOFS-v1). CGOFS includes both ocean circulation and ocean wave models on global and regional scales, providing sustained predictions of 3-D vision on marine temperature, salinity, currents, sea level as well as ocean waves.

CGOFS is composited by six main elements, which are ocean wave forecasting systems for both global ocean and China Seas, global circulation forecasting system, Northwest Pacific circulation forecasting system, the Bohai-Yellow Sea-East China Sea forecasting system and the South China Sea forecasting system. In addition, a high-resolution atmosphere-ocean-wave coupled prediction system has been configured for the China Seas by applying an updated typhoon initialization scheme of HWRF to the Coupled-Ocean-Atmosphere-Wave-Sediment Transport Modeling System (COAWST). Further developments of CGOFS will be achieved within the next 5 years.

Marine Mammals in Malaysia

Azwarina Mohd Azmi[*)], Saifullah Arifin Jaaman

Institute of Oceanography and Environment (INOS), University Malaysia Terengganu (UMT)
21030 Kuala Terengganu, Terengganu.
[*)]E-mail: azwa_azmi@umt.edu.my

Abstract

Marine mammals are totally protected in Malaysia water and Federal laws apply within 200-nautical mile Exclusive Economic Zone (EEZ) under Wildlife protection Act 1972, Fisheries Act 1985, Fisheries Regulation 1999 (Control of Endangered Species of Fish), Wildlife Protection Ordinance 1998 (Sarawak) and Wildlife Conservation Enactment 1997 (Sabah). Marine mammals inhabiting the sea generally include cetaceans (whales, porpoises, and dolphins), sirenians (sea-cows, including manatees and dugongs), and pinnipeds (the carnivores of the group: seals, sea lions and walruses). However, not all of these are found in Malaysia. According to the recent published literature (Jaaman et al, 2010; Ponnampalam, 2012), a total of 27 species of marine mammals have been recorded in Malaysia, consisting mainly of cetaceans and one sirenian species. The research methods used have included boat survey, aerial survey, interview, questionnaire surveys, literature review, and site investigation on stranded or incidentally caught animals. Malaysia is separated into two distinct regions by the South China Sea, which are Peninsular Malaysia in the west (18 known species), and East Malaysia which include the states of Sarawak (17 known species) and Sabah (19 known species).

An introduction of the Marine Ecology Research Center - FIO and perspectives on future cooperation in the tropical seas of Asia

Xuelei Zhang

First Institute of Oceanography, State Oceanic Administration
6 Xianxialing Road, Qingdao 266061, China
E-mail: zhangxl@fio.org.cn

Abstract

The Marine Ecology Research Center (MERC) has been re-organized from three former departments of the First Institute of Oceanography (FIO), aiming for a more effective teamwork to address issues of science and technology of marine ecology. MERC's research scope spans from molecules (hydrocarbons, fatty acids, pigments, DNA, and proteins) to microscopic (cells of phytoplankton, bacteria), individual and more complex and broad levels of the marine ecosystem. MERC has established successful collaboration on marine biological and ecological studies with some of the renown research institutes in the tropical region of Asia. In light of the species diversity yet often endangered status of marine mammals in the tropical Asia, MERC welcomes and encourages research organizations in the region to join efforts exploring a mechanism to share pertinent knowledge and research resources to promote the study, conservation and management of marine mammals.

Cetacean research and conservation work in the Philippines

Jo Marie V. Acebes

[1] *Department of Biology, School of Science and Engineering, Ateneo de Manila University, Katipunan Avenue, Loyola Heights, Quezon City 1108, Philippines*
[2] *Balyena.org, Paseo del Mar, Barangay Pangdan, Jagna, Bohol 6308, Philippines*
Email: jacebes@ateneo.edu

Abstract

There are 27 species of cetaceans known to occur in the Philippines. Cetacean research in the country has been conducted since the early 1990s, yet there are only a few select areas where cetacean species are relatively well-studied. The status of the majority of the cetacean species in the country is still unknown. This presentation focuses on two study sites: the Babuyan Islands in northern Luzon and the Bohol Sea in central Visayas, two of the country's marine key biodiversity areas (mKBA). In the Babuyan Islands, research on humpback whales (*Megaptera novaeangliae*) has been conducted since 2000. This is the longest running research on a cetacean species in the country. Through annual vessel surveys, photo-identification and vocalization studies, the status of humpback whales are being monitored. There are 13 other cetacean species in the Babuyan Islands and opportunistic data are collected on these species during the humpback whale monitoring. Threats to cetaceans in this area are dynamite fishing, by-catch in fisheries, opportunistic hunting, destruction of habitat through unregulated coastal development (i.e. black sand mining), and increased ship traffic.

In the Bohol Sea, 18 cetacean species are known to occur. It is home to various large whales including the blue whale *Balaenoptera musculus* (IUCN status: Endangered), sperm whale *Physeter macrocephalus* (IUCN status: Threatened) and the poorly known Bryde's *Balaenoptera edeni* and Omura's whales *Balaenoptera omurai* (IUCN status: Data Deficient). Except for sparse historical whaling data and a few recent sightings of these species in the area, virtually nothing is known about their distribution, abundance, and genetic identity. Extensive exploitation from past whaling, compounded by persisting by-catches, increased boat traffic and the lack of data on cetacean populations in the area highlights the need to develop conservation management measures. Investigations into the status of these species and the extent of by-catch and other threats while increasing local environmental awareness are fundamental steps to create the tools necessary for the long-term conservation of these populations.

Although all cetacean species are protected under Philippine law, and despite the increased threats to cetaceans virtually wherever they occur in the country, limited funding from the government is directed towards research and conservation of these species. There is also a lack in local capacity in conducting cetacean research primarily due to insufficient funding available to researchers and university students, absence of marine mammal biology and research techniques in the curriculum of universities, and an overall lack of academic and government agency support in this field of study.

Blue Carbon : A new hope for climate change mitigation in tropical coastal-marine ecosystems

Andreas Hutahaean[*)], Restu N. Afi Ati, Terry Kepel, T. Rameyo Adi, Budi Sulistyo

[*)]Email : andreas(at)kkp.go.id, Bluecarbon.indonesia(at)kkp.go.id

Abstract

Tropical coastal-marine ecosystems such as mangroves and seagrass meadows are known as hot spots for biodiversity and for their valuable ecosystem services. Recently, scientists found the important functions of the ecosystems as carbon sequestration or sinks. This carbon is captured by coastal-marine organisms through photosynthesis and has been called blue carbon. The critical role of coastal-marine ecosystems for carbon sequestration (sinks) has been neglected in global climate change discussion. The reasons are mainly due to the lag of scientific data because of the complexity of coastal-marine ecosystems. In South East Asia (ASEAN) countries, particularly in Indonesia, these ecosystems have not received sufficient attention considering their importance for climate change strategy, as most of the attention has gone to terrestrial ecosystems, such as the forest and agricultural sectors. It is therefore, in this workshop the on going Intergated Blue Carbon project in Indonesia will be presented.
Keywords : Blue Carbon, seagrass, mangrove, CO2, ASEAN

Harmful algal blooms and environmental changes in Chinese coastal waters

Douding Lu

Lab of Marine Ecosystem and Biogeochemistry, SOA
Hangzhou 310012 China.
Email: doudinglu@sio.org.cn

Abstract

A remarkble change of harmful algal composition has been occurred in Chinese coastal waters. The frequency of harmful algal blooms has shown remarkable increased trend since the 70's of last century. More recently, around 60 HAB events occurred each year in China (http://www.soa.gov.cn). Areas with frequent HABs mainly include the Changjiang estuary of the Esat China Sea (ECS), the Zhujiang estuary in the South China Sea (SCS), the Bohai Bay and the Liaodong Bay(the northern sea area of China). Particularly, large scale blooms (over 1 000 km^2) have been recorded every year since 1998. *Prorocentrum donghaiense* has become the recurrent bloom species in the East China Sea for more than ten years.Since 1999, *Phaeocystis globosa* has formed massive blooms in the South China Sea and in Tianjing coastal water of the Bohai Sea. A dinoflagellate bloom, caused by *Cochlodinium geminatum* which has not formed blooms elsewhere around the world, occurred recently in the Zhujiang estuary, SCS. Another new bloom in the East China Sea caused by *Karodinium veneficum* is also reamkble. *Azadinium poporum*, an AZA toxin producer, was rerecorded in the Bohai Sea, the East China Sea as well as in the South China Sea. More recently, brown tide caused by *Aureococcus anophageferense* has been registered in the near shore of the Bohai Sea. A number of species have been detected for the first time in this area. The possible related factors for the shift of causative species of harmful algae in China coastal waters include human activities, ballast water dispersal, climate change and so on. The evolvement of HAB causative species in Chinese coastal waters deserves more attentions and efforts in HAB minoring and management in future.

Asian dust deposition in the marginal sea of southern South China Sea: Past and present

Che Abd Rahim Mohamed

Faculty of Science & Technology
Universiti Kebangsaan Malaysia
43600 Bangi, Selangor, MALAYSIA
E-mail: camohd@ukm.my; carmohd@gmail.com

Abstract

Marine ecosystems receive a continuous terrestrial input via lateral and atmospheric transports. Dust mainly containing iron (Fe) is among those terrestrial materials that export from Asia desert to other locations. The central desert of China is one of the most important sources of dust export to neighboring country as well as far in the western part of Pacific Ocean. Neighboring basin that received extensive input of exported dust from China is the marginal sea of southern South China Sea. The significant changes over time period in marine environment will be identified throughout the biogeochemistry study including marine atmospheric, marine sediment core, seawater and coral reef studies. The chronological study includes sedimentary records of a marine ecosystem and the environmental compartment that represent such an effect of coral reefs with dust deposition and climate change. Coral reefs and sedimentary drilling studies, and looking at the calcium compositions define the changes of climate or monsoon over past period of time. The study also includes the chemical compositions of nutrients in marine environment such as nitrogen, phosphorus, silicon, and iron. The preliminary data and research finding will be present and discuss in this workshop.

Keywords: *chemical composition, dust, origin, marginal sea, sediment*

Sediment source, distribution and environmental evolution in the South China Sea and its adjacent seas

Xuefa Shi[1*)], Chuanshun Li[1], Shengfa Liu[1], Shuqing Qiao[1], Zhengquan Yao[1], Yanguang Liu[1] and Narumol Kornkanitnan[2]

[1]The First Institute of Oceanography, State Oceanic Administration, Qingdao 266061, China
[2]Phuket Marine Biological Center, Thailand
[*)]E-mail: xfshi@fio.org.cn

Abstract

As the largest marginal sea separating Asia from the Pacific ocean, the South China Sea (SCS) offers a special attraction for geologists world-wide because of its location and well-preserved sediments. The thick sediments of SCS are favorable for high-resolution paleoceanographic studies because of high sedimentation rates and good carbonate preservation. Since the 2000s, Chinese geoscientists embarked on many active survey and research programs on the SCS and obtained a large number of sediments and related information. Some maps of sediment pattern were published in China. For example, the 1:3000000 sediment pattern map of the whole SCS and the 1:1000000 sediment pattern maps of the northern SCS were published by the State Oceanic Administration.

According to the previous studies, the SCS receives approximately 700 million tons of deposits annually at present, including about 80% of terrigenous matierals provided by the surrounding rivers and 20% of biogenic carbonate and silicates and volcanic ash. In general, the surface sediments distribution is closely tied to water depth and topography: The shallow shelf sediments are mainly fluvial clasts with clay content higher than 80% and sand less than 15%; the slope sediments are composed of hemi-pelagic ooze, including clayey silt and calcareous ooze; and the abyssal basin sediments are mainly composed of calcium-free clay. In the northern SCS, the fluvial sediments from the Pearl River and Red River are the most important source of terrigenous material, and the rivers from southwestern Taiwan transport huge sediments to the continental shelf and slope of the northeastern SCS. For the southern SCS, the fluvial sediments from Pahang River of Peninsular Malaysia and Rajang River of Borneo are important terrigenous source.

At present, the research of the sedimentation and paleoenvironmental evolution in the southern SCS is relatively scarce and needs deepen further. As we all know, the southern SCS lies at the transitional zone of the Western Pacific warm pool and the eastern Indian Ocean warm pool, with the typical environmental characteristics of tropical marginal sea. The southern SCS is connected with the Sulu Sea, Java Sea and Indian Ocean through with some straits. This region is the most active zone of air-sea exchange and the power pump of the El Niño - Southern Oscillation (ENSO), and also the source area of the East Asia summer monsoon. For this reason, we recommend that scientists from China and Southeast Asian countries could carry out extensive cooperation and initiate an international collaborative research program “The paleoenvironment and deposition process of SCS and surrounding seas of Southeast Asian”. So we can study the sedimentary characteristics, sediment source and paleoenvironmental evolution of SCS, also we can compile the sediment pattern maps and study the source to sink process and paleoenvironmental history of SCS.

GPS Responses to the 2011 Mw9.0 Earthquake in Japan

Yanxiong Liu[1*)], Shijie Fan[1,2] ,Fangli Qiao[1], Xinghua Zhou[1], Jian Zheng[1,2]

[1.]The First Institute of Oceanography, State Oceanic Administration, Qingdao 200061, China
[2.]China University of Petroleum, Qingdao 266555, China
[*)]E-mail: yxliu@fio.org.cn

Abstract

A massive Ms 9.0 earthquake occurred on 11 March 2011, off the Pacific coast of the east of Miyagi, Japan. The earthquake caused severe surface dislocations and launched a tsunami. In this paper, our developed software UniP, based on the precise point positioning mode, is used to extract the co-seismic and post-seismic surface movement information from IGS data and Chinese coastal GPS data. The results show: (1) The co-seismic surface deformation processes are clearly recorded by the GPS kinematic positioning results, and these elastic deformation on CHAN and NCST sites is up to 15cm. (2) The massive earthquake did not cause obvious permanent position shift of GPS sites in China, because of distant range. The maximum eastward shift on CHAN is 1.8±0.11cm. (3) The travel time is almost 10 minutes for seismic wave to NCST and NLHT site. The propagation velocity of seismic wave is about 14 times faster than that of tsunami. So the arrival time difference may be enough for the tsunami prediction. These results reveal that GPS technology can provide valuable basic data for earthquake monitoring and dynamic characteristics. It further demonstrates the application potential of Chinese Coastal GPS monitoring system in seaquake monitoring and tsunami warning services.

“BENTHIC” Project: Deep sea sediment records to understand global change

Rainer A. Troa[1], Eko Triarso[1], Sugiarta Wirasantosa[1], Budi Sulistiyo[1], Rameyo Adi[1], Rina Zuraida[2], Susilohadi[2], Wahyoe S. Hantoro[3], Haryadi Permana[3], Xuefa Shi[4], Zhang Xuelei[4], Shengfa Liu[4]

[1]Research and Development Center for Marine and Coastal Resources (RDCMCR), Agency for Marine and Fisheries Research and Development, Ministry of Marine Affairs and Fisheries, Republic of Indonesia
[2]Marine Geology Institute (MGI), Agency of Research and Development for Energy and Mineral Resources, Ministry of Energy and Mineral Resources, Republic of Indonesia
[3]Research Center for Geotechnology (RCG), Indonesia Institute of Science
[4]First Institute of Oceanography (FIO), State Oceanic Administration (SOA), People Republic of China (PRC)

Abstract

"BENTHIC" Project is a marine research activity that is conducted jointly by Republic of Indonesia and P.R. China. Republic of Indonesia is represented by Research and Development Center for Marine and Coastal Resources (RDCMCR) in collaboration with Marine Geology Institute (MGI) and Research Center for Geotechnology (RCG); while P.R. China is represented by FIO. The objective of this research is to understand long-term variation trend of seawater transport and exchange, monsoon, marine ecosystem, and environment focusing in the Eastern Indian Ocean along Western Sumatra to Southern Java Waters. The Eastern Indian Ocean is located in an important area where upwelling, monsoon and tectonic actions occur, so the sediment and benthic organisms store integrated information of the history of the environment, climate and environment. The research will apply multiple parameters analyses for the sediment, suspended matter and benthic organisms on existing and to be acquired cores.

Keyword: “BENTHIC”, global change, deep sea sediment records, Eastern Indian Ocean, multiple parameters analyses

Mekong River Delta: Coastal landform in the last 3000 years and present situation

Van Lap Nguyen[*)] and Thi Kim Oanh TA

HCMC Institute of Resources Geography, VAST, 1 MacDinhChi Street, HoChiMinh City
[*)]E-mail: nvlap@hcmig.vast.vn

Abstract

Based on the changes of morpho-sedimentary map and detailed investigations of deltaic facies in the boring cores, depositional facies and delta evolution patterns are recognized for the last 3000 yeas. A tide- and wave-dominated delta is in the active delta plain and a tide- dominated delta to be in Ca Mau deltaic margin. The tide- and wave-dominated delta has occurred at the active delta plain of which coastline is over 300 km long and subjected under northeast monsoon activity in the East Sea/South China Sea. The coastal landform is characterized by well-known developed beach-ridge system on the subaerial delta plain. The tide- dominated delta has been occurred at the Ca Mau deltaic margin, southwest part of the MRD. It is characterized by well-developed mangrove marsh on the subaerial delta plain. There is not any sandy beach ridge to be found in the subaerial delta plain, and subaqueous delta shows pro-delta and shelf mud facies.

On the basic of topographic maps, satellite images and field measurements, coastline changes are estimated in the last 100 years. In the active delta plain, deposition coastlines are usually located around the active river mouths with its rate of 15- 20 m/y, meanwhile erosion has been occurred severely at the south side of distributaries with its rate of 10- 15 m/y, particularly, up to 30- 40 m/y in Tra Vinh province. In the Ca Mau deltaic margin, coastal erosion is approximately of 30- 50 m/y at Ganh Hao area, meanwhile the Ca Mau cap is well-known as a rapid deposition coastline of 50-80 m/y, some places are up to 100 m/y. This phenomenon is evidently driven by deposition of material discharged by the Mekong river system as well as by material derived from coastal erosion in eastern areas. Moreover, a great sub-tidal mud flat is well developed around the Ca Mau cap, about 18 km long with 530 km^2 in area. Above-mentioned data indicate that the change in coastal landforms of the MRD seems to be effected more strongly by monsoonal activity in the recent years as a consequence of global warming, climate change and human activities.

International cooperation in the upcoming IODP Expedition 349 in the South China Sea

Chun-Feng Li

State Key Laboratory of Marine Geology, Tongji University,
Shanghai 200092, China
E-mail: cfl@tongji.edu.cn

Abstract

The South China Sea (SCS) is situated at the junction of the Eurasian, Pacific, and Indo-Australian plates. It has undergone nearly a complete Wilson cycle despite its relatively small size and short evolutionary history, and it is a critical site linking some of the major western Pacific tectonic units. The opening of the SCS reveals complex patterns of continental margin breakup and basin formation. Despite extensive studies, sampling of basement rocks and overlying sediments in the deep basin is currently lacking. This leaves a large margin of error in estimated opening ages and renders various hypotheses regarding its opening mechanism and history untested. This also hampers our understanding of East Asian tectonic and paleoenvironmental evolution.

International Ocean Discovery Program Expedition 349 (28 January, Hong Kong–30 March 2014, Keelung) will drill three sites to ~100 m into basement in different sub-basins of the SCS to address questions regarding the opening and evolution of the SCS and how it affected the paleoceanography of the region. 31 shipboard scientists from 9 different IODP countries will participate in this expedition. There will also be observers onboard from 3 countries and states (Philippines, Vietnam, Taiwan) surrounding the South China Sea. Port call activities are being scheduled in both Hong Kong and Keelung, where people can take lectures and ship tours of the drilling vessel JOIDES Resolution.

The upcoming IODP Expedition 349 is truly an international venue for research cooperation and forefront scientific discovery. With dedicated contributions from brilliant international scientists of a wide spectrum of expertise, we are looking forward to major discoveries and breakthroughs in our understanding of regional geology of Southeast Asia.

Blue Economy and Policy - A case study in Cambodia

Chea Leng

Ministry of Environment of Cambodia
P.O. Box 2298, Cambodia. N0. 48, Street Preah Sihanouk, Tonle Bassac,
Chamkarmorn, Phnom Penh, Cambodia.
E-mail: lengmoe@gamail.com

Abstract

A healthy natural environment and the services it provides are fundamental to economic growth and human well-being (OECD, 2012). Therefore, striking a perfect balance between economic growth, social transformation and environmental conservation is very important. Therefore, from the sustainable development perspective, Green Economy and Blue Economy are common use in the globe. United Nations Environmental Program (UNEP) (2010) indicated that Green Economy is one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. Qingdao International Blue Economy Summit Forum (2009) indicated that Blue Economy is more scientific and profound and covers a wide range of subjects. It attaches more importance to development of high-level marine industries, balanced utilization of ocean and land resources and scientific innovation as well as protection of the marine ecology. Moreover, the Rio+20 Ocean Declaration (2012) emphasized that the Blue Economy is to ensure the conservation and sustainable management of marine and coastal resources in support of sustainable development and poverty eradication.

The terminology of Green Economy is still a relatively new concept, a new mode of thinking that serve as a guide to action. In addition, the term of the blue economy is very new terminology and concept in Cambodia even though some policies, mechanism and action are in place. This paper will focus on the context of blue economy including development activities to improve economic, laws and regulations, mechanism, and the threat to the blue economy in marine and coastal zone in Cambodia.

A study and perspective on the protection and restoration of coral reef ecosystem

Rongcheng Lin*), Xinqing Zheng, Wentao Niu, Xiaofeng Shi,
Peng Tian and Xiaozhou Yang

The Third Institute of Oceanography, State Oceanic Administration,
Xiamen 361005, China
*)E-mail: rclinxm@189.cn

Abstract

Coral reefs in the coasts of China were destroyed severely in the past 50 years due to anthropogenic disturbances and pollution. To protect and restore the coral reef ecosystem, we have done some indoor and field studies on the corals, such as physiological ecology, phylogeography, molecular evolution and phylogenetics, rapid detection technology of disease germs, techniques of coral artificial cultivation, transplanting and underwater restoration. In future, our studies will focus more on: (1) the effects of temperature and acidification on coral bleaching as well as the adaptive mechanism in the process of bleaching; (2) key technology of indoor coral farming and sexual reproduction; (3) the effect of global change on annual coral growth pattern based on Sr/Ca and B/Ca ratios of the hermatypic coral skeleton; (4) the dynamics of carbonate system in coral reef habitats; (5) using molecular genetic markers to study phylogeography of scleractinian corals in the West Pacific and reef connectivity by coral larvae.

Path and Policies of Blue Economic Development in China

Wang Xiaohui

National Marine Data & Information Service
Tianjin, 300171, China

Abstract

In recent years, the "blue economy" concept has received wide attention, and has become burning issues for the international conferences and organizations, including the Rio+20, APEC and others. Furthermore, as the rotating chair of the APEC, China has determined "Blue Economy" as the theme of the 2014 APEC Summit.

This report in the first place introduced China's understanding of Blue Economy. The Blue Economy of China is aimed to achieve the sustainable development of marine economy and characterized by overall planning, innovative, inclusive and harmonious. Secondly, this report showed the path of blue economic development in China and achievements received. Finally, this report introduced the practice and experience of blue economic development in China, including national planning systems, the pilot programs of blue economy, development of marine emerging industries, capacity building of marine economy monitoring and assessment, national marine economy survey, etc.

Marine pollution and bioremediation : Segara Anakan Nature Reserves case study

Agung Dhamar Syakti

Fisheries and Marine Sciences Department-Jenderal Soedirman University, Indonesia
E-mail: agungsyakti@chemist.com

Abstract

The Indonesian marine environment has a valuable ecosystem, *e.g*. coral reef, sea grass and mangrove, but failures in management of aquatic ressources and environmental law enforcement may cause serious damage to the marine environment. Segara Anakan Nature Reserve (SANR) is our case study describing a mangrove-fringed reserve which has a high diversity of macrobenthic invertebrates but currently is affected by anthropogenic activities. For instance, contamination by petroleum hydrocarbons, persistent organic pollutants (POPs), some emerging pollutants (EPs) compounds as well as trace elements (metals) have been detected across the SANR. From the environmental risk point of view through using risk assessment tools, *e.g.* sediment quality guidelines, metal pollution load, enrichment of heavy metal concentrations and geoaccumulated risk, one specific site has been chosen for further study because of its greater possible ecological risk level for marine organisms. From this site we isolated the strains of hydrocarbonoclastic bacteria capable of degrading hydrocarbons from contaminated mangroves and investigated their ability to degrade total petroleum hydrocarbons (TPH) in a microcosm model of an oily sludge. Such a finding has great potential for the removal of more complex hydrocarbon compounds in the oily full-scale implementation.