

# **Sino-Australian Research Centre for Coastal Management (SARCCM) 2014/2015 Report for 6th Advisory/Management Committee Meeting Dr Xiao Hua Wang (王小华) (SARCCM Director)**



## Cover Image:

Pictured at **The Fifth Sino-Australian Research Centre for Coastal Management Advisory/Management Committee Meeting** held at Ocean University of China, Qingdao 24 October 2014 (left to right front row): Prof. Xu Xiangmin, OUC SARCCM Director; Prof. Sean Cadogan, School of Physical, Environmental and Mathematical Sciences; Prof. Warrick Lawson, Head of School of Physical, Environmental and Mathematical Sciences; Prof. Joseph Lai, Associate Dean International; Prof. Laura Poole-Warren, Pro Vice-Chancellor (Research Training) and Dean of Graduate Research, Division of Research; Prof. Yu Zhigang, President of Ocean University of China and Chair of the SARCCM Advisory Committee; Prof. John Arnold, Deputy Rector, UNSW Canberra; Prof. Peter Steinberg, Director and CEO, Sydney Institute of Marine Science/UNSW; A/Prof. Xiao Hua Wang, UNSW SARCCM Director; A/Prof. Moninya Roughan, Sydney Institute of Marine Science/UNSW.

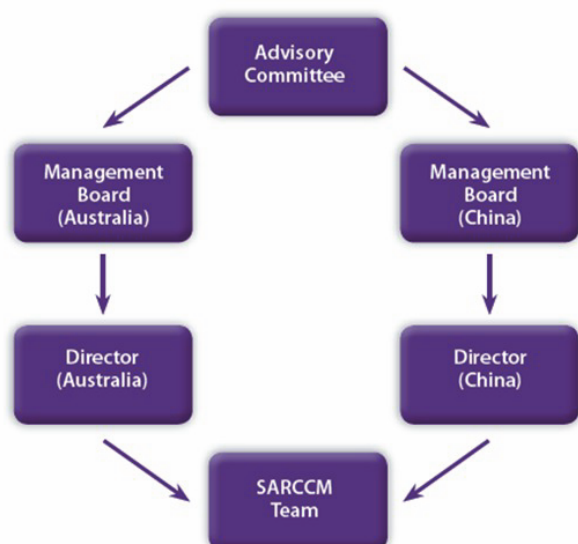
## Centre Contacts:

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**Website:** [www.sarccm.unsw.adfa.edu.au](http://www.sarccm.unsw.adfa.edu.au) (new for 2015)

### Centre Governance:



Sino-Australian Research Centre for Coastal Management

## Director's Report/About the Centre:

Highlights for 2014 included:

- Tracking the paths of identified floating objects to assist the search for missing Malaysian Airlines flight MH370 and pinpoint the crash site zone
- SIMS/SARCCM visits to OUC, QEPB/QCCI, SOA and SKLEC
- Two new researchers – Professor Peter Steinberg and Dr Moninya Roughan
- Welcoming Professor Emma Johnston as a Research Collaborator with SARCCM
- Participation of SARCCM students and staff at the *AMSA Conference*
- 5th Advisory/Management Committee Meeting
- Publication of an *Estuarine, Coastal and Shelf Science* (ECSS, ERA A) Special section Part I on impact on coasts and their ecosystems in the Yellow and East China Sea by intensive anthropogenic activities (<http://www.sciencedirect.com/science/journal/02727714/151>)
- Partnership with SIMS on the World Harbour Project (WHP) initiative and taking the lead to facilitate Chinese partnerships in the WHP
- A UNSW-OUC Collaborative Research Workshop (Synergy in the Study of Sydney Harbour, Shanghai Port, and Jiaozhou Bay)

Highlights for 2015 included:

- UNSW approval for SARCCM to continue for the next three years after a successful Centre Review
- Official naming of the UNSW-Sed model
- Conference organisation and participation at the *7th International Workshop on Modeling the Ocean (IWMO2015)*; June 1-5, 2015, Canberra, Australia
- ECSS review paper: 'The status of coastal oceanography in heavily impacted Yellow and East China Sea: Past trends, progress, and possible futures'
- Strategic Planning Meeting for SARCCM Thursday 28 May 2015
- SARCCM's new research link with the Academician Institute of Coastal Material Transport and Integrated Environmental Management at OUC
- OUC delegation visit to Canberra and establishment of the OUC Alumni Association in Australia
- SARCCM PhD student Haifeng Zhang winning the 3 minute thesis (3MT) competition at UNSW Canberra.

If you are interested in working with us at SARCCM, in collaborative research or as a postgraduate, please contact us to discuss how we might progress our common interests. We look forward to working with you.

Associate Professor Xiao Hua Wang (王小华) (SARCCM Director)



## SARCCM capacity and capabilities statement:

- **The vision of The Sino-Australian Research Centre for Coastal Management (SARCCM) is to become a world leader in coastal integrated research with a focus on observation and numerical modelling of coastal and estuarine processes, to support sustainable development and improve management of the coastal zones worldwide.**

SARCCM has a proven track record of providing high-quality research outcomes to inform coastal zone management, e.g. (i) numerical simulations of Darwin Harbour have indicated that if the mangroves and tidal flats were reclaimed, the total sediment flux would be orientated reversely from seaward to landward causing increased harbour siltation. (ii) A recent study on the impact of Chinese land reclamation on tides in Korea has predicted that planned reclamation of coastal wetlands on China's Jiangsu coast will lead to an immediate increase in the high tide level of 400 mm on the coast of Korea. This will cause frequent flooding in the low lying areas including Incheon and Mokpo, and dwarfs the current IPCC estimation of sea level rise due to global warming of 1.7 mm/year. (iii) One of the most challenging problems in the Yangtze Estuary is the severe silting in the Deepwater Navigation Channel (DNC) of Shanghai Port. The annual amount of dredging for maintaining the DNC in 2013 exceeded 100 million m<sup>3</sup>, with an estimated dredging cost of AUD\$780 million. Research undertaken by SARCCM has shown that the upstream non-local sediment intrusion through the spill-over-mechanism at the opening of the DNC is a major source of the sediment trapping in the DNC after the morphological changes.

SARCCM is a Research Centre of the University of New South Wales-Australia with a multidisciplinary/multi-faculty research focus on coastal problems. SARCCM was established in November 2010, and resides in the School of Physical, Environmental and Mathematical Sciences (PEMS). It has a productive team from UNSW and its collaborative organizations include the University of Wollongong, University of Technology (Sydney), and Central Queensland University. Since 2010, SARCCM has attracted strong interest from the national and international scientific community as well as industry partners in Australia and China. The need for SARCCM has increased and matured since its establishment. This is demonstrated by an expanding research network of collaborators from scientists, government managers, as well as industrialists both in Australia and China. SARCCM is currently working with Australian and Chinese institutions on the matter of management and development in coastal eco-systems. Key partnerships include sustained collaboration and competitive grant applications with the Ocean University of China (OUC), Qingdao City Construction Investment Ltd (QCCI), and the Marina Industry Association of Australia (MIA).

**SARCCM's key capability is research and research training in observing and modelling hydrodynamics, sediment transport, and the biochemical processes in coastal environments (bays, harbours, estuaries and their adjacent shelf waters).** An emerging capability is in research higher degree training in environmental management that combines human and biophysical research insights into actionable knowledge.

SARCCM is collaborating on the World Harbour Project (WHP, <http://www.worldharbourproject.org>) with the Sydney Institute of Marine Sciences (SIMS). For the next 3-5 years SARCCM will be undertaking research in Jiaozhou Bay (China), and thus providing expertise on hydrodynamics and sediment transport dynamics for the WHP. Expanding collaboration in other countries will enhance the visualization of the Centre by the international scientific community, e.g. an Indonesian coastal management research frontier is being established in 2014 using SARCCM as an incubator.



# SARCCM Governance:

## SARCCM Advisory Committee:

- Prof Zhigang Yu (于志刚), President, Ocean University of China
- Prof Song Sun (孙松), Yantai Institute of Coastal Zone Research, Chinese Academy of Sciences
- Prof. Michael Frater
- Dr Xiao Hua Wang (王小华)
- Prof. Xiangmin Xu (徐祥民)
- Dr Junji Song (宋军继)
- Mr Xiaohua Bu (卜笑华)
- Industry advisors (1x)
- Government Department representatives (1x)

Management Board Australia	Management Board China
<b>Directors:</b> <ul style="list-style-type: none"> <li>• A/Prof. Xiao Hua Wang (Director)</li> <li>• A/Prof. Stuart Pearson (Deputy Director)</li> </ul>	<b>Director:</b> <ul style="list-style-type: none"> <li>• Prof. Xiangmin Xu (徐祥民) (Director)</li> </ul>
<b>Management Board:</b> <ul style="list-style-type: none"> <li>• Prof. Michael Frater (Rector)</li> <li>• A/Prof. Xiao Hua Wang (王小华) (Director)</li> <li>• A/Prof. Stuart Pearson (Deputy Director)</li> <li>• Prof. Warrick Lawson (HoS)</li> <li>• Prof. Peter Steinberg</li> <li>• Prof. David Waite</li> <li>• A/Prof. Linlin Ge</li> </ul>	<b>Management Board:</b> <ul style="list-style-type: none"> <li>• Prof. Dexing Wu (吴德星)</li> <li>• Prof. Xiangmin Xu (徐祥民)</li> <li>• Prof. Huajun Li (李华军)</li> <li>• Prof. Yinjie Ma (马英杰)</li> </ul>
<b>SARCCM Team Australia:</b> <ul style="list-style-type: none"> <li>• A/Prof Xiao Hua Wang (王小华)</li> <li>• Prof. Peter Steinberg</li> <li>• A/Prof. Stuart Pearson</li> <li>• A/Prof. Linlin Ge (葛林林)</li> <li>• Dr Xiuping Jia (贾秀萍)</li> <li>• A/Prof Moninya Roughan</li> <li>• Dr Andrew Kiss</li> <li>• Dr David Paull</li> <li>• Dr Zhi Huang</li> <li>• Dr Jo Banks</li> <li>• Dr Qianguo Xing</li> <li>• Mr Christopher Lane</li> <li>• Dr David Leary</li> <li>• Ms Julie Kesby (Research Officer)</li> </ul>	<b>SARCCM Team China:</b> <ul style="list-style-type: none"> <li>• Prof. Xiangmin Xu (徐祥民)</li> <li>• Prof. Huajun Li (李华军)</li> <li>• Prof. Ge Chen (陈 戈)</li> <li>• Prof. Gang Fu (傅 刚)</li> <li>• Prof. Jie Bai (白 洁)</li> </ul>

The management board meets biannually to discuss, oversee and provide guidance on all matters mandated by Centres Procedure. The meeting agenda includes setting and reviewing the strategic direction and objectives of the Centre; evaluating the performance of the Centre against its objectives. The first meeting is held in UNSW Canberra in December and the second one in UNSW Sydney/SIMS in June, respectively. A third meeting may be scheduled in a joint session with the annual Advisory Committee meeting in Ocean University of China in October, if the opportunity arises.

# **The Fifth Sino-Australian Research Centre for Coastal Management Advisory/Management Committee Meeting and UNSW-OUC Collaborative Research Workshop (Synergy in the Study of Sydney Harbour, Shanghai Port and Jiaozhou Bay) held at Ocean University of China, Qingdao 24 October 2014**

October 24, 2014 marked the opening of the Advisory/Management Committee Meeting of the Sino-Australian Research Centre for Coastal Management (SARCCM) and the UNSW-OUC Collaborative Research Workshop (Synergy in the Study of Sydney Harbour, Shanghai Port, and Jiaozhou Bay), at the Academic Exchange Centre on OUC's Yushan Campus. The meeting paid tribute to the University's 90th anniversary. Presided over by Mr Dai Hua (from the International Office at OUC), the meeting was attended by Prof. Yu Zhigang (President of OUC), Prof. Laura Poole-Warren (Pro Vice-Chancellor (Research Training) and Dean of Graduate Research, Division of Research, UNSW), Prof. John Arnold (Deputy Rector of UNSW Canberra), Heads of the Schools at UNSW Canberra, Prof. Peter Steinberg (Director of World Harbour Project at Sydney Institute of Marine Science), and Mr Wang Xiulin (Vice Chairman of Chinese People's Political Consultative Conference, Qingdao). Experts and scientists from South China Sea Institute of Oceanology of Chinese Academy of Sciences, Institute of Zoology of Chinese Academy of Sciences, East China Normal University, East China Sea Branch of State Oceanic Administration, Yantai Institute of Coastal Zone Research, Research Institute of Qingdao Environment Protection Bureau, Command Centre of Qingdao Port Group, OUC's College of Physical and Environmental Oceanography, College of Chemistry and Chemical Engineering, College of Marine Geosciences, Law and Politics School, and College of Economics were also represented at the meeting. The list of participants is below.

The meeting was opened by a welcome speech delivered by Prof. Yu Zhigang, President of OUC, who spoke highly of the progress made by SARCCM. He expected the two universities to continue cooperation and communication. During the meeting, A/Prof. Wang Xiao Hua, Director of UNSW SARCCM, presented the achievements made in 2013 and 2014. The Centre published a special issue entitled "Impact on coasts and their ecosystems in the Yellow and East China Sea by intensive anthropogenic activities" in the ERA A journal of *Estuarine Coastal and Shelf Science*. Centre members were also invited to present at the Blue Economy Forum. The Centre has also cultivated doctoral candidates. Prof. Xu Xiangmin from the Law and Politics School of OUC, Director of OUC SARCCM, presented the operational details of the official website of Jiaozhou Bay Institute for Coastal Management (JIM). JIM was established in May 2014 and is affiliated to SARCCM. <http://web.ouc.edu.cn/sarccm/xgyjjg/list.htm>

At the UNSW-OUC Collaborative Research Workshop (Synergy in the Study of Sydney Harbour, Shanghai Port and Jiaozhou Bay), 12 academic presentations were delivered on the topic of "integrated research on Jiaozhou Bay", "integrated research on Sydney Harbour" and "integrated research on Shanghai Port". The workshop was briefed on the achievements made in the integrated research on Jiaozhou Bay in terms of Qingdao Port development and social changes; typhoon's effects on water quality at Jiaozhou Bay; and ecological effects from coastal reclamation. Australian delegates delivered reports on Sydney Harbour's marine ecological restoration; responses of oysters to the changes of marine environment; changes of shelf circulation in eastern Australia; and process of sediment dynamics around harbours. Reports were also made on the observations on hydrodynamics of deep water channels; simulation on sediment dynamics in Shanghai Harbour; trends of marine environment in the Yangtze River estuary; and microbial diversity in the Yellow Sea.

Prof. John Arnold, Deputy Rector of UNSW Canberra, in summarizing this meeting, said that the two universities enjoyed close cooperation and had made great achievements in research. He placed high hopes for a wider and deeper cooperation in the future.

Meeting minutes are as follows:

1. Contributors of *ECSS* special issue “Impact on coasts and their ecosystems in Yellow and East China Seas by man-induced activities” to continue the revision and review of the articles.

2. OUC and the Qingdao Academy of Environmental Sciences to form a research team to participate in the launching ceremony of World Harbour Project on the World Parks Congress which will be held in Sydney, Australia from November 11 to 18, 2014.

Sino-China Coastal Zone Management Research Centre, 27 Oct 2014.

### **The list of participants**

#### **SARCCM Advisory Committee members:**

- Chair: Prof. Yu Zhigang, President of Ocean University of China
- A/Prof. Wang Xiaohua, Director of SARCCM at UNSW
- Prof. Xu Xiangmin, Director of SARCCM at OUC

#### **Other participants:**

##### **Qingdao**

- Mr Wang Xiulin, Vice Chairman of CPPCC of Qingdao (former Vice Mayor of Qingdao)
- Mr Sun Hekun, Director of Research Centre under the Qingdao Environmental Protection Bureau (QEPB)
- Dr Fu Hui, Director of General Office at QEPB
- Mr Su Jianguang, Chief Building Commander, Qingdao Port Group Company
- Prof. Dai Hua, International Office, OUC
- Prof. William Zou, International Office, OUC
- Ms Summer Zhao, International Office, OUC
- Prof. Ma Yingjie, OUC
- Prof. Qiao Lulu, OUC
- Prof. Liang Shengkang, OUC
- Prof. Li Keqiang, OUC
- Prof. Li Jingmei, OUC
- Dr Wu Wen, OUC
- Dr Song Dehai, OUC

##### **Shanghai**

- Prof. Li Xiangyu, SKLEC/ECNU
- Dr Ren Xu, East China Sea Branch, SOA

#### **Other Chinese Participants**

- Dr He Weihong, South China Sea Institute of Oceanology, Chinese Academy of Sciences
- Dr Gong Jun, Yantai Institute of Coastal Zone Research, Chinese Academy of Sciences

##### **Australia**

- Prof. Laura Poole-Warren Pro Vice-Chancellor (Research Training) and Dean of Graduate Research, Division of Research, UNSW
- Prof. Michael Frater, Rector, UNSW Canberra
- Prof. John Arnold, Deputy Rector, UNSW Canberra
- Prof. Joseph Lai, Associate Dean International, UNSW Canberra
- Prof. Warrick Lawson, Head of School of Physical, Environmental and Mathematical Sciences, UNSW Canberra
- A/Prof Andrew Neely, Deputy Head of School of Engineering and Information Technology, UNSW Canberra
- A/Prof Twan Huybers, Deputy Head of School of Business, UNSW Canberra
- A/Prof. Wang Xiao Hua, SARCCM Director, UNSW Canberra
- A/Prof. Stuart Pearson, SARCCM, UNSW Canberra
- Prof. Sean Cadogan, School of Physical, Environmental and Mathematical Sciences, UNSW Canberra
- Prof. Peter Steinberg, Sydney Institute of Marine Science/UNSW
- Dr Moninya Roughan, Sydney Institute of Marine Science/UNSW
- Prof. David Raftos, Sydney Institute of Marine Science/Department of Biological Sciences, Macquarie University
- Dr Sheng-nan Chen, UNSW/SARCCM

*SARCCM 2014/2015 Report for 6th Advisory/Management Committee Meeting*

- Dr Guan Dong Gao, UNSW/SARCCM

## **SARCCM research programs and objectives:**

New research programs and objectives were developed during 2015 resulting from SARCCM's Review and the Strategic Planning Meeting held on Thursday 28 May 2015. There are now three programs with objectives and deliverables for 2016.

### **Program 1: Coastal oceanography**

**Program Leader:** A/Prof. Xiao Hua Wang

Prof. Peter Steinberg, Prof. Emma Johnston, A/Prof. Moninya Roughan, Dr Andrew Kiss, Mr Chris Lane, Ms Zhibing Li, Mr Guan Dong Gao, Ms Amanda Xiao, Ms Zhixin Chen

#### **Objectives:**

- To develop and apply hydrodynamics and sediment transport models in estuaries, ports, and turbid coastal environments;
- To explore the structure, function, dynamics and interactions of marine ecosystems and their relationships with common environmental stressors within estuarine and coastal waters;
- To develop regional coastal ocean observing and forecasting system.

#### **Deliverables in 2016:**

- UNSW-Sed to be coupled with FVCOM 4.0;
- Applications of UNSW-Sed in the WHP;
- Application for ACJRC to transform urban ports and harbours both in China and in Australia.

### **Program 2: Coastal and marine natural resource management, people, policy, practice**

**Program Leader:** A/Prof. Stuart Pearson

MA Yingjie, SONG N'iger, A/Prof. Stuart Pearson, Dr Jo Banks, Dr David Leary, Ms Amanda Putri, Mr Saiful Marbun, Dr Shengnan Chen, Ms Bo Dong, Mr Maozeng Jiang

#### **Objectives:**

- Fostering excellence in comparative research on natural resource management in China, Australia and with other international partners.
- Sharing of research knowledge and development of new insights and capacity to contribute to marine and coastal natural resource management.

#### **Deliverables in 2016:**

- PhD completion – Shengnan Chen
- MPhil completion – Saiful Marbun
- New PhD research project topics drafted in late 2015.
- Submitted papers (2)
- Conference papers (3)
- Blue Economy discussion paper

### **Program 3: Remote sensing/GIS**

**Program Leader:** TBA

A/Prof. Linlin Ge, Dr Dave Paull, Dr Xiuping Jia, Dr Zhi Huang, Dr Chunhui Zhou, Dr Qianguo Xing, Mr Haifeng Zhang, Miss Meng Xu



## Objectives:

- In this task, we will examine and assess to which extent the routine measurements from spaceborne sensors are combined and used together with model-based forecasting systems. The outcome shall form the basis of a series of recommendations concerning bridging the gap of Chinese/Australian capacity for utilizing spaceborne measurements in the framework of an operational ocean forecasting system.

## Description:

- Collect the data from current satellites and the information of future satellites which will be launched in the near future for coastal ocean observation (SST, wind, waves, sea ice, ocean colour and surface current).
- Investigate multi-temporal data processing techniques for retrieving the ocean environmental parameters as a time series to match the goals of ocean applications in the China Seas and Australia waters. Develop cloud removal techniques to generate frequent optical images.
- Investigate data fusion approach to integrate big data including multi/hyperspectral, SAR, and LiDAR from both optical and microwave sensors.
- Collect UAVs and field data for ground trothing and validation.

## Deliverables in 2016: TBA

## Selected research highlights for 2015:

- **UNSW-Sed model officially named**

Xiao Hua Wang's group has been developing a sediment transport dynamics model for turbid estuaries and coastal seas for last 10 years. SARCCM is pleased to announce that this model has been officially named as **UNSW-Sed** with the University approval for non-commercial use. Furthermore, UNSW-Sed has been chosen to be included in FVCOM (Finite-Volume, primitive equation Community Ocean Model, <http://fvcom.smast.umassd.edu/fvcom/>) as one of three cohesive sediment module options (the other two are 1) DELFT-3D based, 2) USGS community sediment model). FVCOM is an internationally well-known unstructured grid community ocean model specialized in estuarine and coastal ocean hydrodynamics and ecosystem modelling. It is jointly developed by University of Massachusetts-Dartmouth and Woods Hole Oceanographic Institution. This UNSW-Sed will be published both in the manual and version 4.0 of FVCOM.

- **The World Harbour Project (<http://www.worldharbourproject.org>)**

The World Harbour Project is a SIMS initiative aimed to facilitate, link and enhance programs of research and management across major urban harbours of the world, in order to help build resilience globally for these iconic urban waterways and the cities that surround them. SARCCM is both a part of this initiative and an independent research centre, at UNSW and is taking the lead to facilitate Chinese partnerships in the WHP.

The Chinese partners are: Jiaozhou Bay in Qingdao (Ocean University of China, Qingdao Environment Protection Bureau), and Shanghai Port (East China Normal University). Other international partners include:

- Sydney (Australia): SIMS and the Sydney Harbour Research Project
- Auckland (New Zealand): Massey University
- Singapore: National University of Singapore, The Singapore Centre on Environmental Life Sciences Engineering
- Jakarta (Indonesia): Bandung Institute of Technology
- Abu Dhabi / Dubai (the United Arab Emirates): New York University @ Abu Dhabi

- Rio de Janeiro (Brazil): Federal Fluminense University (UFF)
- St. Georges (Grenada): Dept. of Agriculture and Fisheries
- Chesapeake Bay (USA): Smithsonian Environmental Research Centre

- **Organisation and participation at 7th International Workshop on Modeling the Ocean**

SARCCM is very pleased to announce that 7th International Workshop on Modeling the Ocean (IWMO; June 1-5, 2015, Canberra, Australia) was a great success. IWMO 2015 was organized by SARCCM, and sponsored by CSIRO, Canberra Convention Bureau/Think Canberra, ARC Centre for Excellence/Climate System Science, UNSW Canberra, and SARCCM. The number of participants was 80 and 70 papers were submitted from 16 countries around the world including papers by SARCCM students.

- **Collaborative research link with Academician Institute of Coastal Material Transport and Integrated Environmental Management” at OUC**

SARCCM has established a collaborative research link with the newly established “Academician Institute of Coastal Material Transport and Integrated Environmental Management” at OUC. This Institute aims to promote the university’s multi-disciplinary research in coastal science and management, and carry out both basic and applied research in a number of interdisciplinary areas including oceanography and integrated coastal zone management.



**The launch of the Academician Institute of Coastal Material Transport and Integrated Environmental Management at Ocean University of China, April 27, 2015, by Prof. Xianglong Jin (5<sup>th</sup> from left of front row), the Chinese Academy of Engineering; and Prof. Yegang Sun (4<sup>th</sup> from left of front row), the Chairman of the University Council, Ocean University of China.**

- **SARCCM PhD student Haifeng Zhang won the 3 minute thesis (3MT) competition at UNSW Canberra.**

Congratulations to Haifeng Zhang as one of the three winners of the 3 minute thesis competition (3MT). Haifeng did an excellent job in his speech with precision, humour and clarity. The three 3MT UNSW Canberra winners competed at UNSW Sydney in September.

Further congratulations to Haifeng Zhang for being selected as an invited speaker for the upcoming Satellite Oceanography Users Workshop to be held in Melbourne, 9-11 November 2015. Haifeng will give a presentation on the "Use of IMOS-GHRSST products to quantify diurnal warming over the Tropical Warm Pool" covering v2 HRPT AVHRR, v3 MTSAT-1R and possibly Himawari-8 (if it is available in time).



***OUC delegation visit to Canberra and establishment of the OUC Alumni Association in Australia.***

## **Current research students:**

### ***Field of Study: Oceanography***

**Fatemeh Ziaeyan Bahri**, PhD - Research Topic - Correlation between east Australian current and sea level rise along the east coast of Australia.

**Zhixin Cheng**, MPhil, - Research Topic - Hydrodynamic study of sediment transport patterns in estuary and coastal area: Case study on Yalu River Estuary.

**Guandong Gao**, PhD - Research Topic - Land reclamation and its impact on hydrodynamics and sediment transport in Jiaozhou Bay, Qingdao, China.

**Wenyun Guo**, (ECNU Joint Training PhD student) - Research Topic - Numerical study of sediment dynamics in Shanghai Port.

**Maozeng Jiang**, PhD - Research Topic - Legal and cultural frameworks for risk management in Antarctic and Subantarctic areas: What Informs Australia's and China's positions and activities in relation to environmental protection.

**Zhibing Li**, PhD - Research Topic - Modelling sediment transport in Port of Abbot Point and its adjacent Great Barrier Reef waters.

**Fanglou Liao**, PhD – Research Topic – Modelling of coastal trapped waves in Jervis Bay and along east coast of Australia.

**Saiful Marbun**, MPhil - Research Topic - Impacts of marine and fisheries industrialisation and the Blue Economy Policy in Indonesia on the local communities and the environment in Indonesia.



**Amanda Putri**, PhD - Research Topic - Water pollution in Jakarta Bay and the impacts on environmental degradation and social-economic aspects of local fishers.

**Ziyu Xiao, (Amanda)**, PhD - Research Topic - Modelling hydrodynamics and sediment transport in Sydney Harbour.

**Haifeng Zhang**, PhD - Research Topic - Investigating sea surface temperature diurnal variation over the tropical warm pool using MTSAT-1R.

## Recent submissions by research students:

### *Field of Study: Oceanography*

**Donghui Jiang**, PhD- Research Topic - An operational circulation and ecology forecast system for Jervis Bay, NSW.

## Recent graduate student:

### *Field of Study: Oceanography*

Chen, S., 2015, The legal and regulatory framework for integrated coastal zone management: A comparison between Australia and China, July 2015, PhD. Available from: <http://handle.unsw.edu.au/1959.4/54743>

## Potential PhD topics:

### **1. What ocean do Lagrangian observing platforms (e.g., Argo and drifting buoys) observe ?**

In the mid- and high-latitudes the ocean circulation is composed largely of eddies and fronts. In isolation an ocean eddy is relatively stable being in quasi-geostrophic balance and retaining a closed material surface around its core water mass. It is only through the disruption or destruction of this balance through eddy-interactions that an exchange in mass with its environment takes place. Only at these times is it possible for a Lagrangian observing platform to enter or exit the eddy circulation. This poses many interesting questions such as how frequently do these platforms observe eddies and what are the implications for constructing climatologies of the ocean and ocean forecasting. This research would make use of state of the art high resolution ocean models, analysis of altimetry and the in situ Argo and drifting buoy observations available at the Bureau of Meteorology and the global ocean observing system.

**2. Characterisation of ocean forecast errors from an ocean forecasting system.** A state-of-the-art prediction system makes several assumptions about the errors of the observing system, the ocean models, the atmospheric forcing and data assimilation methodology. Correctly modelling and estimating these errors and validating or improving these assumptions is critical to further improving performance. This project will focus on the available database of forecast innovations and increments from the BLUElink ocean prediction system and determine the systematic bias as well as the statistical distribution. Specific methods will then be developed to deconstruct and attribute error to different components of the system as well as hypothesis testing.

**3. Helen Beggs leads the GHR SST Tropical Warm Pool Diurnal Variability (TWP+) Project** which aims to quantify diurnal warming of the surface ocean over the Tropical Warm Pool to the north of Australia and to validate and compare various diurnal variation models over this region.

The International Group for High Resolution Sea Surface Temperature (GHR SST) TWP+ data set would be a great resource for any PhD student with a background in either physical oceanography, air-sea heat exchange, marine meteorology and/or satellite oceanography. Further information on the TWP+ Project can be found at <https://www.ghrsst.org/ghrsst-science/science-team-groups/dv-wg/twp/> <<https://www.ghrsst.org/ghrsst-science/science-team-groups/dv-wg/twp/>> .

The GHR SST Workshop on Tropical Warm Pool and High Latitude SST Issues (Melbourne, 5-9 March 2012) would be an excellent opportunity for a new PhD student to choose a TWP+ related research project that matches their interests and abilities. The workshop will focus on presentations relating to initial research for the TWP+ Project and using the TWP+ data set during the three working days of the GHR SST workshop.

Further information on the GHR SST Workshop can be found at <https://www.ghrsst.org/ghrsst-science/Meetings-and-workshops/workshop-on-tropical-warm-pool-and-high-latitude-issues/> <<https://www.ghrsst.org/ghrsst-science/Meetings-and-workshops/workshop-on-tropical-warm-pool-and-high-latitude-issues/>> including a draft agenda which lists the current TWP+ research activities.

#### **4. Impact of East Australian Current observations Tasman Sea eddies in an ocean model**

##### **Introduction**

Can observations of the East Australian Current using a HF ocean surface radar improve model forecast skill of meso-scale eddies in the Tasman Sea?

The study will use observations at Coffs Harbour (30S, 153E) which extend approximately 100 km east across the East Australian Current (EAC) and perform assimilation impact studies on a domain encompassing upstream of Coffs Harbour, the EAC separation (at approximately Smoky Cape, 31 S), and the Tasman front (across to New Zealand), with a particular emphasis on meso-scale eddies.

##### **OSR observations**

The HF OSR measures surface currents in the top few tens of centimetres of the ocean, on a few km resolution with a range of around 100 km over 10 minute time scales. The OSR is part of the IMOS ACORN facility and is planned to commence operation in February 2012. Routine data delivery could be expected by mid-2012. Observations show the EAC is largely barotropic, so OSR should be representative of the depth-integrated current.

##### **The Ocean Model CLAM? Assimilation**

The HF OSR provides currents in regions where the two radars overlap (and the subtended angles of the ray are greater than ~20). Outside of this region there is another equally extensive area where there is only one useful current vector component resolved. While not suited to visual interpretation, single current vector components can be assimilated into ocean models.

The model already assimilates altimetry, SST and temperature and salinity profiles, so any skill improvement will be in excess of this. The assimilation of HF OSR observations may also be useful in the situation where altimetry is degraded (due to loss of satellites or other problems). It would be useful to quantify the impact of assimilating OSR currents in the absence (or reduction) of altimetry.

Possible candidate data-sets for skill evaluation are feature tracking, surface drifters (these are probably drogued to a few metres depth), or synTS. The first two sources will probably generate sparse data-sets. Maybe the evaluation will be achieved by looking at the increments in SSH?

##### **Links to other Work**

We have previously looked at the impact of observations on models using the error estimates in the data assimilation system (Oke et al., 2009). It would be instructive to see how data withholding experiments compare to the observation network design study tool.

Oke, P. R., Sakov, P. & Schulz, E.W., 2009, A comparison of shelf observation platforms for assimilation in an eddy-resolving ocean model, *Dynamics of Atmospheres and Oceans*, 48, 121-142, doi: 10.1016/j.dynatmoce.2009.04.002.

#### **5. Predictive mapping of seabed cover, benthic habitats, benthic biodiversity using multibeam bathymetry and backscatter data**

Coastal marine benthic environment, which is dreadfully under-studied, has significant economic and conservation values. Sustainable management of this marine ecosystem requires high quality physical and biological datasets on the benthic environment and scientific evidence on the interactions between these physical and the biological variables. Modern multibeam sonar systems, with different sonar frequencies, are capable of accurately mapping large area of seabed from water depth of a few metres to thousands metres. They can provide high-resolution and near-complete coverage of bathymetry and acoustic backscatter data for mapping seabed substrata, benthic habitats and benthic biota.

The proposed project would involve intensive field campaigns collecting multibeam data, water column data, sediment samples and biological data. The collaboration with OUC is critical for the collection and analysis of these data. We would provide expertise in the areas of data analysis, modelling and result interpretation.

#### **6. Using hyperspectral remotely sensed data for monitoring coastal water quality**

Airborne Hyperspectral Remotely Sensed data has very high spatial and spectral resolutions. It is therefore most suitable for fine-scale and detailed investigation of coastal water quality. The hyperspectral reflectance is jointly influenced by a range of physical and biochemical conditions in the near-surface water. These water quality factors include chlorophyll, phytoplankton, dissolved organic materials, suspended sediments,



dissolved oxygen, and surface temperature, etc. The hyperspectral data can thus be used to accurately estimate the concentrations of these water quality parameters and to monitor their seasonal and annual changes.

The proposed project would involve intensive field campaigns collecting hyperspectral data and water quality data at selected seasons. This would be followed by solid data analysis to quantify the relationship of various water quality factors to the reflectance at specific wavebands, which is highly significant and challenging. The collaboration with OUC is critical for the collection and analysis of these data. We would provide expertise in the areas of data processing, modelling and result interpretation.

## **7. Generalised dependence for the ocean sea drag**

The sea-- - drag coefficient is the main property which is employed to parameterise the air-- - sea interactions in large-- - scale models, from engineering applications to climate research. Over the last 30 years, however, scatter of the experimental dependences for the sea drag parameterised as a function of wind speed and/or wave age did not improve. The proposed project would intend to develop a generalised parameterisation of the sea drag as a function of multiple environmental forcings, for use in meteorological, climate and ocean engineering applications.

## **8. Coastally trapped wave observations and modelling around Australia**

**Program Code:** 1082

**Supervisors:** A/Prof. Xiao Hua Wang (hua.wang@adfa.edu.au), Dr Ming Feng, CSIRO, A/Prof Moninya Roughan and Dr Andrew Kiss (UNSW)

Australia is surrounded by major ocean boundary currents – with the East Australian Current off the east coast, the Leeuwin Current off the west coast, and the South Australian Current/Flinders Current off the south coast. The Integrated Marine Observing System (IMOS) has set up shelf circulation monitoring systems for the major boundary current systems over the past six years. The observing systems include shelf moorings, gliders, and surface radar systems. The ocean boundary current systems vary on different time scales, such as seasonal and intra-seasonal. The aim of this study is to utilise the IMOS mooring networks and numerical models to understand the coastally trapped wave propagations around Australia, forced by wind anomalies on intra-seasonal and whether time scales, and their interactions with the ocean boundary current systems. The intra-seasonal variability of the ocean boundary currents are important in understanding the extreme events in these systems.

## **9. Remote sensing study on the East Australian Current**

**Program Code:** 1082

**Supervisors:** A/Prof. Xiao Hua Wang (hua.wang@adfa.edu.au) and Dr Zhi Huang, Geoscience Australia

East Australian Current (EAC) is a significant boundary current that flows poleward. On the way, it separates and generates many large and small eddies that cause lots of oceanographic dynamic. It has significant ecological impact on the eastern margin of Australia from about 25S. This PhD project aims to use time-series remotely sensed data to map EAC's spatial structures and investigate the spatial and temporal variability of EAC's characteristics. The remotely sensed data to be used include more than 10 years MODIS SST and Chlorophyll a datasets. We also intend to use satellite altimetry data in combination with the broad scale BlueLink model to help the mapping and validation, especially in the identification of eddies. This PhD project will further develop the techniques used in supervisor's (Huang) similar study on the Leeuwin Current of Western Australian margin (Huang and Feng, 2015). Co-supervisor Wang's expertise in EAC system will be utilised in guiding the design of this study and assessing the results of this study, among others. The successful PhD candidate is expected to have a strong research and analytical skills. Experience and skills in either Remote Sensing or Physical Oceanography field or both are highly desirable.

**These brief research questions are possible projects for research higher degree students under the supervision of A/Prof. Stuart Pearson:**

- What is the Blue Economic Zone and what will its success bring to society, environment and economy? How will it be monitored and evaluated? What does this show about the research needs for China's environmental law, science and management? [with A/Prof Ma Yingjie]

- Why is eco-compensation so popular in China? What does this show about the research needs for China's environmental law, science and management? [with Ma Yingjie]
- How is risk of environmental research, environmental management and environmental policy considered in Australia and China? Current topics for PhDs have related to biofuel policy [with Dong Bo], Antarctica's research program [with Maozeng Jiang] and so what do you think should be studied next?
- Who cares? Using a social science approach, how can the values, attitudes and dreams of Australia and China's young professionals be understood and what scenarios can be plausibly developed? Environmental research, environmental management and environmental policy considerations of young people in Australia and China. How does this contribute to government research? [with Yantai Institute and NSW Government]

How widely and how appropriate is applying the Kuznets curve thinking in China a rational Natural Resource Management response? China's rapid development and transition to a eco-civilisation is widely discussed as a stage requiring 'development first and clean-up second'. What is the nature of the evidence used by narrators to justify this and what are the plausible scenarios?

## Visitors and Visiting Fellows to SARCCM:

### Visitors and Visiting Fellows for 2015 and beyond:

- **Dr Joanne Banks, P/time – SARCCM and SIMS – 15 January 2015 – 14 January 2018**  
Postdoctoral Research Fellow, World Harbour Project Coordinator, part time SARCCM and Sydney Institute of Marine Science.

### Visitors and Visiting Fellows for 2015:

- **Dr Joanne Banks, P/time – SARCCM and SIMS – 15 January 2015 – 14 January 2018**  
Postdoctoral Research Fellow, World Harbour Project Coordinator, part time SARCCM and Sydney Institute of Marine Science.
- **A/Prof. Kelian Chen, TIO/SOA 30 December 2014 – 31 May 2015**  
A research paper 'Advancing the practice of marine eco-compensation in China: Knowledge synthesis from implementation 2011-2014' with co-authors Stuart Pearson. Xiao -Hua Wang, Hong-xu Yu and Julie Kesby is currently in press.
- **Associate Professor Donglan Xu, OUC 27 Sept 2014 – 26 September 2015**  
Donglan presented a paper "'Green" productivity's changing trend under fishery management policies in Australian Commonwealth fisheries' in the UNSW Canberra Asia Pacific Seminar Series, 21 September 2015.
- **A/Prof. Zhanhai Li, ECNU 25 March 2015 – 24 September 2015**  
A/Prof. Zhanhai Li is from the State Key Laboratory of Estuarine and Coastal Research, East China Normal University, Shanghai, China. A/Prof. Li collaborated with A/Prof. Hua Wang on the World Harbour Project to investigate sediment transport in Shanghai Port. A/Prof. Li is jointly sponsored by ECNU and SIMS.
- **Dr Qianguo Xing, YIC/CAS 17 March 2015 – 31 January 2016**  
Dr Qianguo Xing is from Yantai Institute of Coastal Zone Research, Chinese Academy of Sciences, China. He will collaborate with the SARCCM Remote Sensing/GIS group with a research topic entitled 'Optimizing the algorithms of extracting the information of macroalgal blooms'. Dr Xing is sponsored by the China Scholarship Council.
- **Dr Chuhui Zhou, WuhanUT 1 August 2014 – 31 July 2015**  
Dr Chuhui Zhou is a Visiting Fellow to SARCCM, sponsored by the China Scholarship Council (CSC). Dr Zhou is from the School of Navigation, Wuhan University of Technology, China. Chuhui visited SARCCM for 12 months. He is an expert in Photogrammetry and Remote Sensing and worked with A/Prof. Xiao Hua Wang on a project entitled 'Remote sensing of coastal upwelling along the southeast coast of Australia'.

- **Dr Yaping Wang, NJU 30 May 2015 – 6 October 2015**

Dr Yaping Wang is a Professor in the School of Geographic and Oceanographic Sciences, Nanjing University. Dr Wang has published more than 100 peer-viewed academic papers in the field of marine sediment dynamics. His research interests mainly focus on the measurement and modeling of sediment re-suspension, and flocculation and sedimentation in the marine bottom boundary layer. Dr Wang is collaborating with A/Prof. Xiao Hua Wang on sediment dynamics research.

- **Dr Jianyu Hu, XU 29 June – 31 August 2015**

Dr Jianyu Hu, Prof. of Physical Oceanography, State Key Laboratory of Marine Environmental Science, College of Ocean and Earth Sciences, Xiamen University, China visited SARCCM from 29/6/15 - 31/8/15 to carry out collaborative research for the project entitled 'The coastal eddies and upwellings'.

## Visiting Fellows for 2014:

- **Dr Jianyu Hu**, Prof. of Physical Oceanography, State Key Laboratory of Marine Environmental Science, College of Ocean and Earth Sciences, Xiamen University, China visited SARCCM from **16 April 2014 - 16 October 2014** to carry out collaborative research for the project entitled 'The coastal eddies and upwellings'.
- **Associate Professor Donglan Xu, OUC visited from 27 September 2014 – 26 September 2015.** After graduating from Dalian Industry University, China, Donglan worked at the Environmental Protection Bureau of Yanji, Jinlin Province, in China. She has a Masters degree from Kyungpook National University, South Korea (1998-2000), and PhD (2002-2005), post-doc course (2005-2007) in Nagoya University, Japan. After her long overseas study, she returned to China and has been an Associate Professor in School of Economics, Ocean University of China since 2007. Her research interests include environmental and energy economics, marine economics and productivity analysis.
- Dr Keliang Chen, an Associate Professor in Third Institute of Oceanography, State Ocean Administration, PRC, visited from **30 December 2014 - 31 May 2015**. He has been engaged in the research of marine environmental management and policies for many years, especially, marine eco-compensation regulations.
- **Dr Chunhui Zhou**, VF sponsored by the China Scholarship Council (CSC). Dr Zhou is from the School of Navigation, Wuhan University of Technology, China. Chunhui visited SARCCM from **1 August 2014 – 31 July 2015**. He is an expert in Photogrammetry and Remote Sensing and worked with A/Prof. Xiao Hua Wang on a project entitled 'Remote sensing of coastal upwelling along the southeast coast of Australia'.

## SARCCM meetings & workshops:

- ***SIMS/SARCCM Visit to OUC on March 3rd, 2014***

On the morning of March 3rd 2014, Prof. Li Huajun (Vice President of the Ocean University of China (OUC)) met Prof. Peter Steinberg (Director, CEO of the Sydney Institute of Marine Science (SIMS)), Prof. Warrick Lawson (Head of School, School of Physical, Environmental and Mathematics Sciences), as well as A/Prof. Xiao Hua Wang (Director of the UNSW Sino-Australian Research Centre for Coastal Management) at its Laoshan campus. They exchanged views towards strengthening the research cooperation and collaboration of the World Harbour Project (WHP).

Further to the above meeting, OUC President Prof. Wu Dexin met the SIMS/SARCCM delegation on the morning of March 5th 2014. President Wu welcomed the delegation to OUC and again expressed his strong support for the WHP. He is looking forward to a successful SIMS/OUC research collaboration.

## **The outcomes of the visits:**

The meetings of the SIMS/SARCCM delegation with OUC, QEPB, QCCI and SOA East China Sea Marine Monitoring Centre have led to the following agreements on the World Harbour Project:

1. Letter(s) of intent to participate (in principle) in the WHP.
2. UNSW/OUC Jiaozhou Bay and Sydney Harbour Research Synthesis Workshop at OUC on 24 October 2014 to celebrate OUC's 90th Anniversary.
3. Participation in a workshop by SARCCM and appropriate other representatives from Qingdao/Shanghai at the IUCN Congress where the WHP would be announced and the work program of the WHP discussed and initiated.
4. In parallel pursuit of funding for the project, both in Qingdao/Shanghai and for the Australian component which will need to fund specific activities and an overarching framework. Some of this has begun with the NSW State Government.



***SIMS/SARCCM delegation meeting with Vice President Prof. Li Huajun of OUC.***



***SIMS/SARCCM delegation meeting with OUC President Prof. Wu Dexin.***

### **▪ SIMS/SARCCM Visit to QEPB/QCCI on March 4th, 2014**

On the morning of March 4th, 2014, Prof. Peter Steinberg, Prof. Warrick Lawson and A/Prof. Xiao Hua Wang met with Mr Sun Hekun (Director of Qingdao Environmental Science Research Institute, Qingdao Environmental Protection Bureau (QEPB)). Mr Sun Hekun introduced his Institute's research on Jiaozhou Bay and their protection plan for the Bay, expressing their wish of further cooperation with SIMS/SARCCM. Prof. Peter Steinberg gave an introduction of the WHP and mentioned that this project would be launched on the IUCN's World Parks Congress this year in Sydney when scientists from more than 20 countries would discuss the same topic, and that it would be an important opportunity for cooperation with scientists from all over the world.

On the afternoon of March 4th, 2014, the delegation paid a visit to the Qingdao City Construction Investment Group (QCCI) and had a discussion with its Vice President Mr Xiaohua Bu as well as the other QCCI members. The Chairman of the Marina Industry Association of Australia, Mr Andrew Chapman, also attended the meeting. Prof. Peter Steinberg reported the background of SIMS, the Sydney Harbour Research Program and the WHP, including its current status. Mr Bu introduced the Qingdao Harbour construction project. Mr Chapman discussed marina and harbour management issues in Australia and expressed his strong support for the World Harbour Project. It should be noted that, under Mr Chapman's support, QCCI's Qingdao Marina had been accredited a 4.5 star ranking according to the world marina grading standard. Mr Xiaohua Bu said that the QCCI would continue to strengthen cooperation with the OUC as well as the Australian partners in order to protect Jiaozhou Bay's environment.

After the meeting, the Australian visitors conducted a tour around the Qingdao Olympics Sailing Venue and Museum.

### **▪ SARCCM Visit to State Oceanic Administration (SOA) East China Sea Branch in Shanghai on March 8th, 2014**

On March 8th, A/Prof. Xiao Hua Wang visited SOA East China Sea Marine Monitoring Centre in Shanghai. Hua presented SARCCM's work on Shanghai Port sediment dynamics, and discussed collaboration on the



Changjiang estuary, green tides research and the WHP with the Director of the Centre, Prof. Xu Ren. Director Xu is very interested in the WHP and said that his Centre is keen to be involved.

▪ ***Report on SIMS/SARCCM Delegation to the State Oceanic Administration (SOA) East China Sea Branch, Shanghai, on the World Harbour Project***

In the afternoon on May 6 of 2014, SIMS/SARCCM delegation visited the State Oceanic Administration (SOA) East China Sea Branch in Shanghai. The delegation was welcomed by the Branch Director General Mr Liu Gaifu. Peter presented an introduction of the WHP; Moninya on the Sydney Harbour Research Program. Mr Xu Ren, Director of SOA East China Sea Marine Monitoring Centre, introduced his Centre's work on the Shanghai Port. He reported that SOA East China Sea Branch is interested to collaborate with SIMS/SARCCM on the WHP. The Branch's proposal to collaborate with SIMS/SARCCM on the WHP is now under consideration in the SOA Central Office in Beijing. After the meeting, the delegation toured the SOA research facility.

▪ ***Report on SIMS/SARCCM Delegation to State Key Laboratory of Estuarine and Coastal Research (SKLEC), East China Normal University (ECNU) on the World Harbour Project***

In the morning on May 6 of 2014, Prof. Peter Steinberg, A/Prof. Xiao Hua Wang and Dr Moninya Roughan from the Sydney Institute of Marine Science (SIMS) and the Sino-Australian Research Centre for Coastal Management (SARCCM) at the University of New South Wales (UNSW), a partner in SIMS, visited the State Key Laboratory of Estuarine and Coastal Research (SKLEC), East China Normal University (ECNU). Prof. Yunxuan Zhou and SKLEC board members attended the discussion on the World Harbour Project and related issues.

The World Harbour Project is a SIMS initiative aimed to facilitate, link and enhance programs of research and management across major urban harbours of the world, in order to help build resilience globally for these iconic urban waterways and the cities that surround them. SARCCM is both a part of this initiative and an independent research centre, at UNSW and is taking the lead to facilitate Chinese partnerships in the WHP. SKLEC is interested to join the WHP as the research team for Shanghai Harbours.

Planned activities for future cooperation:

- Try different funding sources globally
- SKLEC will send students to UNSW/SIMS for up to twelve months as visiting students, or four years for PhD degree. (Possible for dual PhD degrees?)
- Students can also apply for scholarships from UNSW directly.
- SKLEC welcomes SIMS students with CSC scholarships for both short term and long term study.
- SKLEC will send early-career scientists and technical staff to visit SARCCM and SIMS for short term research and training.
- SKLEC would like to invite scientists from SARCCM and SIMS to do short visit and give lectures to graduate students.
- SKLEC welcome scientists from SARCCM/SIMS to conduct cooperative research.

The group of the workshop has been invited to attend the workshop held by the Sino-Australian Research Centre for Coastal Management, October 24, 2014 at OUC, Qingdao.



***SIMS/SARCCM delegation meeting with Director of SKLEC/ECNU Prof. Yunxuan Zhou and his Board of Directors.***



- **OUC SARCCM Meeting, Qingdao, China, 8 May 2014**

Assoc. Prof. Xiao Hua Wang chaired an OUC SARCCM meeting in Bohai Hall, Blue Horizon Hotel Qingdao, on 8 May 2014. The purposes of the meeting were to: (1) summarize the progress made after the UNSW-OUC Workshop in mid-October 2013; (2) discuss the future SARCCM work plans.

- **UNSW-OUC Research Workshop on 24 Oct 2014**

Assoc. Prof. Wang introduced the schedule of the October UNSW-OUC Workshop 2014: in the morning of October 23, 2014, the Australian delegation will arrive at Qingdao, and in the afternoon, a meeting with OUC CSC students and interviews will be arranged; On October 24, 2014 the UNSW-OUC Research Workshop will be held; on October 25, 2014 some of the delegation members will attend the 90th anniversary celebrations of OUC and OUC Global Ocean Summit on 25-26 October. The workshop will be attended by three delegations from Australia: UNSW Sydney, Sydney Institute of Marine Science and UNSW Canberra, and two delegations from the East China Normal University (ECNU) and the East China Sea Branch, SOA. The workshop will also be attended by members of Qingdao Municipal Institute of Environmental Protection and Qingdao City Construction Investment Group. The workshop title was identified as "The Comparative Study of Sydney Harbour, Shanghai Port and Jiaozhou Bay". The main topics include: sediment; interaction between estuaries and shelves; the impact of dredging, dam construction and reclamation on the environment; the impact of eutrophication on ecology; wetland research; ecology; ocean colour and light physics; coastal management and policy (law); disaster assessment and risk management; observation and remote sensing; coastal ecology economy and coastal engineering.

- **SARCCM and PEMS, UNSW Canberra participate at the AMSA Conference 6-10 July 2014**

The **Australian Marine Science Association (AMSA) 51st Anniversary Conference** was held recently (6-10 July 2014) at the National Convention Centre in Canberra. AMSA is the premier professional society for marine sciences in Australia. As such the event offered a great opportunity to engage with marine scientists, researchers, graduate students from universities, policy makers and environmental consultants for professional networking, exchanging ideas, identifying new collaborations and making new friends. The School of Physical, Environmental & Mathematical Science (PEMS), UNSW Canberra and the Sino-Australian Research Centre for Coastal Management (SARCCM) was well represented at the conference with PhD student **Shengnan Chen** giving an oral presentation; **Xiaohua Wang, Robin Robertson, Amanda Putri, Saiful Sahat Tua Marbun, Stuart Pearson, Fernando Pinheiro Andutta, Younjong Sun** each presenting a poster (presentation titles below); and **Amanda Xiao** attending.

The posters were displayed over four days and the delegates answered many different questions about presented research projects and postgraduate research at UNSW Canberra. Shengnan Chen did very well with her talk and received good feedback from the interested audience. The conference ended up with a fantastic gala dinner at Old Parliament House.



PEMS's sponsorship is acknowledged for an exhibition stand where SARCCM and PEMS Oceanography research was displayed throughout the conference.

### Posters:

- **Amanda Putri and Stuart Pearson** – Poverty and pollution impacts in Jakarta's fishing villages.
- **Robin Robertson** – Investigating tidal effects on mixing and cross-shelf transport and their impacts on nitrate and other nutrient concentrations.
- **Sheng-Kang Liang, Stuart Pearson, Wen Wu, Ying-jie Ma, Lu-lu Qiao, Xiao Hua Wang, Ling-mei Li and Xiu-lin Wang** – Review of research and management of Jiaozhou Bay, Qingdao, China.
- **Wen Wu, Xiao Hua Wang and David Paull** – Evaluating the Australian Defence Force environmental management system: A case study of Shoalwater Bay Training Area, Queensland.
- **Shengnan Chen and Stuart Pearson** – Comparison of the legal and regulatory frameworks surrounding marina developments in Qingdao and Sydney.
- **Li Li, Xiao Hua Wang, David Williams and Fernando Andutta** – Effects of the mangroves and tidal flats on suspended sediment transport in Darwin Harbour, Northern Territory of Australia.
- **Youn-Jong Sun, Xiao Hua Wang and Donghui Jiang** – A coastal upwelling by wind-driven forcing in Jervis Bay, NSW – A numerical study of 2011.
- **Saiful Marbun and Stuart Pearson** – Indonesian Marine Policy – Impacts of fisheries industrialisation and the Blue Economy Policy.

### ▪ ***UNSW Canberra presents OUC with a UNSW Canberra-OUC 90th Anniversary Commemorative PhD Scholarship 2015-2019 to mark OUC's 90th Anniversary.***

On the occasion of the 90th anniversary of Ocean University of China (OUC), a delegation led by Prof. John Arnold, Deputy Rector of the University of New South Wales Canberra (UNSW Canberra) attended the 90th Anniversary Ceremony of OUC and presented OUC with a UNSW Canberra-OUC 90th Anniversary Commemorative PhD Scholarship 2015-2019.

Prof. Li Huajun, Vice President of OUC, met with the delegation on 23 October 2014 at the Yellow Sea Hotel in Qingdao. "The two universities have enjoyed effective collaboration for mutual development during the past few years. Many graduates from OUC have achieved PhD degrees at UNSW and we would like to sincerely thank UNSW for the excellent education and attention they have provided for the OUC graduates", said Prof. Li in his welcome speech. He also expressed his gratitude to UNSW's generous action to present OUC with scholarships for doctoral candidates. "OUC will also endeavour to promote the exchange activities with UNSW to better enhance the cooperative ties between our two sides," added Prof. Li.

Prof. John Arnold also expressed his aspiration to further develop the friendly relationship between the two universities. "I would like to welcome more students to come and study at UNSW Canberra and wish to witness even closer cooperation between us and OUC," said Prof. Arnold in his speech. During the meeting, Prof. Arnold presented OUC with a plaque of the scholarship to Prof. Li. The presentation was also attended by representatives from the OUC International Office, Finance Department, Graduate School, School of International Education, Law and Politics School, and Sino-Australian Research Centre for Coastal Management (SARCCM).



**A/Prof. Xiao Hua Wang, UNSW SARCCM Director  
at the 90<sup>th</sup> OUC celebrations.**



- ***Prof. Arnold, Deputy Rector, UNSW Canberra, presented OUC with a plaque of the UNSW Canberra OUC 90th Anniversary Commemorative PhD Scholarship 2015-2019 to Prof. Li, Vice President of OUC.***

- ***OUC and SARCCM meeting at Laoshan campus on 27 October 2014***

Ocean University of China (OUC) Vice President Ju Yan met with Assoc. Prof. Xiao Hua Wang, Director of Sino-Australian Research Centre for Coastal Management (SARCCM) at OUC's Laoshan campus on 27th October, 2014. Assoc. Prof. Wang introduced recent achievements in Jiaozhou Bay research projects, including eight publications in a SI of *Estuarine, Coastal and Shelf Science* entitled 'Impact on coasts and their ecosystems in the Yellow and East China Sea by intensive anthropogenic activities'; establishment of the World Harbour Project in partnership with SIMS, establishment of the Jiaozhou Bay Institute for Coastal Management (JIM) and convening of three workshops with a cross-disciplinary research team.

- ***OUC delegation visit to UNSW Canberra and SARCCM Workshop 14 November 2014***

An Ocean University of China (OUC) delegation visited UNSW Canberra on November 14 2014 led by Professor Xianwen Bao (Deputy Dean, College of Oceanography). A SARCCM Workshop was held to welcome the delegation and to discuss further collaborations between UNSW Canberra and OUC. More than 20 people attended the workshop, including Professor Warrick Lawson (HOS of PEMS), Dr Scott Sharpe (PEMS Research Coordinator), and Chris Lane from CoastalCOMS.

Pictured below is the OUC delegation with SARCCM Workshop participants.





## Recent Publications:

### 2015

#### **Journal - Refereed & Scholarly Article**

Chen, S. & Pearson, S., 2015, Managing China's coastal environment: Using a legal and regulatory perspective, *International Journal of Environmental Science and Development*, 6(3), 225-230. Available at: <http://www.ijesd.org/vol6/595-M0019.pdf>. Published with acknowledgement of SARCCM, but no number assigned.

Liang, S.-k., Pearson, S., Wu, W., Ma, Y.-j., Qiao, L.-l., Wang, X. H., Li, J.-m., & Wang, X.-l. 2015, Research and integrated coastal zone management in rapidly developing estuarine harbours: A review to inform sustainment of functions in Jiaozhou Bay, China. *Ocean & Coastal Management*, 116, 470-477. doi: 10.1016/j.ocecoaman.2015.09.014. SARCCM Paper No. 20.

Ma, Y.-j., Lu, L.-s., & Pearson, S., 2015, Studies on the legal issues of environmental protection of the Jiaozhou Bay, *Marine Sciences*, 39(3). doi: 10.11759/hyxx20140904002. No number or clear acknowledgement but published by a SARCCM member at OUC, and SARCCM member at UNSW Canberra.

Wang, X. H., Cho, Y.-K., Guo, X., Wu, C.-R., & Zhou, J., 2015, The status of coastal oceanography in heavily impacted Yellow and East China Sea: Past trends, progress, and possible futures, *Estuarine, Coastal and Shelf Science*. doi: 10.1016/j.ecss.2015.05.039. SARCCM Paper No. 26.

Xing, Q., Hu, C., Tang, D., Tian, L., Tang, S., Wang, X., Lou, M., & Gao, X., 2015, World's largest macroalgal blooms altered phytoplankton biomass in summer in the yellow sea: Satellite observations, *Remote Sensing*, 7(9), 12297-12313. doi: 10.3390/rs70912297. Has SARCCM affiliation but not numbered.

Zhang, H., Wu, Q., & Chen, G., 2015, Validation of HY-2A remotely sensed wave heights against buoy data and Jason-2 altimeter measurements, *Journal of Atmospheric and Oceanic Technology*. 32(6), 1270–1280. doi: 10.1175/JTECH-D-14-00194.1. SARCCM Paper No. 22.

#### **Theses**

Chen, S., 2015, The legal and regulatory framework for integrated coastal zone management: A comparison between Australia and China, July 2015, PhD. Available from: <http://handle.unsw.edu.au/1959.4/54743>.

2014

**Book Chapter**

Andutta, F., Wang, X.H., Li, L. & Williams, D., 2014, Hydrodynamics and sediment transport in a macro-tidal estuary: Darwin Harbour, in: Eric Wolanski (ed.), *Estuaries of Australia in 2050 and Beyond*, (pp. 111-129), Springer, Dordrecht, ISBN, 978-94-007-7018-8. SARCCM Paper No. 13.

**Journal - Refereed & Scholarly Article**

Gao, G.D, Wang, X.H. & Bao, X.W., 2014, Land reclamation and its impact on tidal dynamics in Jiaozhou Bay, Qingdao, China, *Estuarine, Coastal and Shelf Science*, 151, 285-294. doi: 10.1016/j.ecss.2014.07.017, SARCCM Paper No. 19.

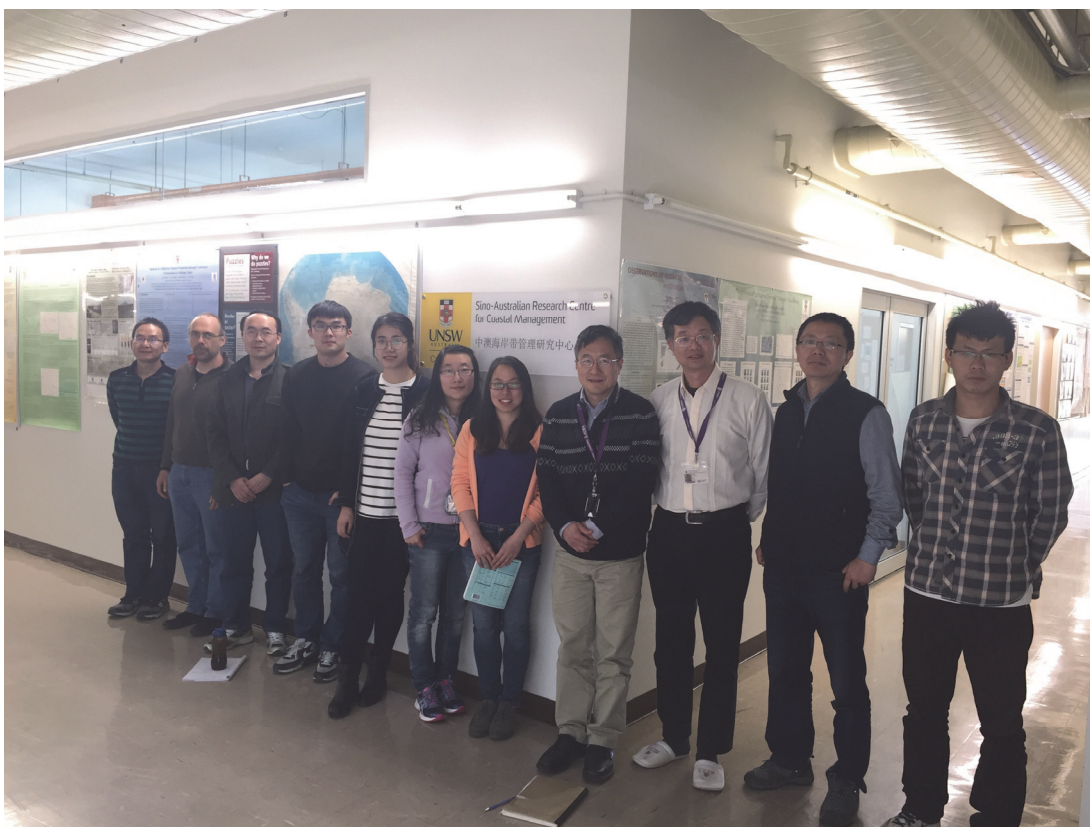
Li, L., Wang, X.H., Andutta, F. & Williams, D., 2014, Effects of mangroves and tidal flats on suspended-sediment dynamics: Observational and numerical study of Darwin Harbour, Australia, *Journal of Geophysical Research: Oceans*, 119(9), 5854-5873, doi: 10.1002/2014JC009987. SARCCM Paper No. 17.

Wang, X.H., Bhatt, V. & Sun, Y-J., 2014, Seasonal and inter-annual variability of western subtropical mode water in the South Pacific Ocean, *Ocean Dynamics*, 1-12, doi: 10.1007/s10236-014-0792-8.

Zhang, F., Wang, X.H., Nunes, P.A.L.D., & Ma, C., 2014, The recreational value of gold coast beaches, Australia: An application of the travel cost method. 11, 106-114, *Ecosystem Services*, doi: 10.1016/j.ecoser.2014.09.001. No SARCCM assigned number.

**Conference paper**

Putri A., Pearson S.G., 2014, Poverty and pollution impacts in Jakarta's fishing villages (vulnerability assessment and scenario of liveability), in *3rd International Conference on Sustainable Built Environment, Faculty of Civil Engineering and Planning, Islamic University of Indonesia and Research Institute for Human Settlements, Agency of R&D Ministry of Public Works, Indonesia*, pp. 34-48, presented at 3rd International Conference on Sustainable Built Environment, Yogyakarta, Indonesia, 21 October-22 April 2014



**Acknowledgement:**

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