Global Ocean Observing System

Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies

First Workshop of IOC Sub-Commission for the Western Pacific on its SEAGOOS Pilot Project on Ocean Forecasting Demonstration

Phuket, Thailand
30 September- 1 October 2010

GOOS Report No. 186

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UNESCO/IOC SUB-COMMISSION FOR THE WESTERN PACIFIC
(WESTPAC)

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SUMMARY REPORT

1. OPENING

1. The First Workshop of the IOC Sub-Commission for the Western Pacific (WESTPAC) on its SEAGOOS Pilot Project on Ocean Forecasting Demonstration was opened in the morning of 30 September 2010 in the Phuket Marine Biological Center (PMBC) of Thailand. The workshop was organized by the IOC Regional Secretariat for the Western Pacific (WESTPAC Secretariat) with generous host of the PMBC. Dr. Somkiat Khokiattiwong, SEAGOOS Coordinator, chaired the workshop.

2. At the opening session, Dr. Wannakiat Thubthimsang, Director of Phuket Marine Biology Center (PMBC) of Thailand, congratulated the opening of this very important workshop, and expressed his warm welcome to all participants on behalf of the host organization. He briefly reviewed the development history of this pilot project on Ocean Forecasting Demonstration, which was initially evolved from the ongoing cooperation between China, Thailand and Malaysia in order to maximize the scientific and social-economic benefits generated for the whole region. He finally reiterated the strong support of his institute to be provided in the implementation of this pilot project.

3. Mr. Wenxi Zhu, Head of the WESTPAC Secretariat, while thanking the PMBC for the excellent arrangements made for this workshop on behalf of the IOC Sub-Commission for the Western Pacific (WESTPAC), recalled that WESTPAC established the SEAGOOS programme in 2002 in view of the importance of sustained, high-quality operational oceanography in the wider Southeast Asian region to assist member states in their efforts for sustainable development, disaster mitigation and better understanding and ultimately prediction of regional and global climate variability. Tremendous attempts have been made by the SEAGOOS Coordinator and WESTPAC Secretariat over past three years in promoting the SEAGOOS, mainly through the development of SEAGOOS strategy and pilot project. In this regard, he extended his appreciation to Dr. Somkiat Khokiattiwong, SEAGOOS coordinator and Prof. Fredolin Tangang, SEAGOOS Pilot Project Leader on Ocean Forecasting Demonstration, and Dr. Fangli Qiao for their efforts in the development of this very useful pilot project with objectives to: (1) develop an ocean forecasting system for Peninsular Malaysia eastern's shelf and Gulf of Thailand at the initial stage with the

wave-tide-circulation model developed by the First Institute of Oceanography; (2) enhance understanding of oceanographic processes in the region, and (3) build the regional modelling capacity, particularly for young scientists in this region. By concluding his remarks, he encouraged more participation of the member states in WESTPAC and its SEAGOOS programme and expected the project would generate more exciting results, not only in the scientific aspect, but also in the social and economic aspects.

2. SELF-INTRODUCTION OF PARTICIPANTS

4. All participants were invited to give a self introduction. The list of participants was attached as Annex 1 to this report.

3. OVERVIEW OF THE PILOT PROJECT HISTORY AND WORKSHOP OBJECTIVES

5. Prof. Fredolin Tangang, Pilot Project Leader, briefed the meeting that the development of one pilot project for SEAGOOS on Ocean Forecasting could possibly date back to more than one year ago when WESTPAC organized the SEAGOOS Pilot Project Development Workshop (5-6 March 2009, Phuket , Thailand) in which, one SEAGOOS Pilot Project "Monsoon Onset Monitoring and its Social & Ecosystem Impacts" (MOMSEI) was initiated and the possibility of pilot project on ocean forecasting demonstration were also briefly discussed. Afterwards, plenty of cooperation and collaboration on the development of ocean forecasting system among China, Malaysia and Thailand has been established based on the wave-tide-circulation coupled model developed by the First Institute of Oceanography, State Oceanic Administration of China. This primarily led to the development of this SEAGOOS pilot project in order to generate wider benefit to other countries in the region. This pilot project will initially demonstrate the value of ocean forecasting system on the Peninsular Malaysia's eastern shelf and Gulf of Thailand, through the development of wave-tide-circulation coupled numerical model for the two sub-regions. This pilot project was officially established by the WESTPAC at its 8th Intergovernmental Session in Bali, Indonesia, 10-13 May 2010.

6. He further explained that, in addition to share the information on the current national capability on ocean model development and proposed activities in the implementation of this project, this workshop was expected to come up with a comprehensive project document through in-depth discussions on several key issues, such as funding, joint cruises, training and regional workshops, and consider the possibility among SEAGOOS members of incorporating into this pilot project the inter-models comparison among different global models which was raised at the one workshop on " Ocean Forecasting Project for IOGOOS and SEAGOOS " in Perth, Australia, July 9-10, 2010.

7. Clarifications were made by Dr. Somkiat Khokiattiwong and Mr. Wenxi Zhu concerning the development history of this pilot project. As a matter of fact, the development of Ocean Forecasting System for SEAGOOS should date from the time when Wenxi joined the WESTPAC Secretariat in late 2006. Extensive discussions have been made between Dr. Somkiat and Mr. Wenxi Zhu with a view to exploring practical ways of promoting SEAGOOS, including the ocean forecasting demonstration. Communications have ever been conducted with several ocean modeling groups in the region for the development of some primary forecasting products in the SEA region with aims to demonstrate the value of ocean forecasting system for the SEAGOOS society.

8. The meeting took note of the development history of this SEAGOOS Pilot Project and agreed on the proposed tentative workshop program which is attached, together with General Project Concept and other background information to the report as Annex-2.

4. NATIONAL PRESENTATIONS AND PROPOSED ACTIVITIES IN THE IMPLEMENTATION OF THIS PILOT PROJECT

9. While stressing the need of Malaysia for this pilot project to develop the capability and capacity in ocean modelling and operational oceanography, improve the understanding on some key oceanographic process in the region as well as develop and operate an ocean forecasting system, Prof. Fredolin Tangang from Malaysia outlined their work on ocean modeling for the southern region of South China Sea for the last five years and the collaboration with First Institute of Oceanography, China on the development of wave-tide-circulation coupled model. He also briefed the meeting on the fund- raising efforts to be made to ensure the smooth implementation of this project in Malaysia. Prof. Mohd Lokman Husain, Institute of Oceanography, Universiti Malaysia Terengganu also added information on his institute’s capacity in marine scientific research, observations and expressed the willingness to join and contribute to the implementation of this project.

10. Dr. Somkiat Khokiattiwong from Thailand started his presentation by introducing the national team of Thailand for this project. He emphasized the importance of the development of ocean forecasting system in the Gulf of Thailand and Andaman Sea in view of crucial oceanographic information needed for the fisheries, oil and gas exploitation, land based pollution control, oil spill risk and natural disaster mitigation. He also highlighted the need for the pilot project to improve the understanding on the process of the ever-increasing concern over coastal erosion, sea level rise, climate variability and water circulation in the Gulf of Thailand, and expected this project could build up the national capacity on ocean forecasting and motivate more and more young scientists/students to devote themselves to physical oceanography in his country. He finally suggested regional cooperation be further strengthened throughout the implementation of this project owing to the

complexity of trans-boundary oceanographic processes.

11. Dr. Fangli Qiao, First Institute of Oceanography, State Oceanic Administration of China, detailed the experience of China in the development of ocean forecasting system with the wave-tide-circulation coupled model, which proved to have greatly enhanced the ocean and climate prediction capability. With the help of the model, the spread trend of the green algae bloom in the coastal areas of Qingdao in 2008 and 2010 has been accurately predicted, providing a powerful support for mitigating the effects of green algae bloom in a scientific manner. He also highlighted the role of WESTPAC as a regional platform provided for marine scientists in the region to share the knowledge, stimulate new ideas, initiate and implement regional activities of their common interests. With it, collaboration has been established among member countries on the development of an ocean forecasting system over past two years, which have laid a solid foundation for the development of this pilot project within SEAGOOS. He further suggested, in addition to these generic objectives for this project, several key scientific objectives be taken into account, namely, role of wave and tidal mixing in the formation and maintaining of the circulation system, seasonal variation of the coastal strong current, detection of the eddy in summer and winter, compensated current in Gulf of Thailand, upwelling on Peninsular Malaysia's eastern shelf and its ecosystem effects and water exchange through the Strait of Malacca, etc. Project activities were proposed as: creation of the wave-tide-circulation coupled numerical model in participating countries; Model validation (through archived data and in-situ data) and operation; conduct of joint cruises and training workshops. He finally reiterated the willingness of his institute to share the wave-tide-circulation model code with other participating countries and provide training opportunities, mainly through the newly established UNESCO/IOC Regional Training and Research Center on Ocean Dynamics and Climate, to young scientists in the implementation of this project.

12. Dr. Pavel Tkalich from the National University of Singapore was invited, as an observer to introduce the development of regional ocean forecasting system in Singapore which has been mainly carried out by the Tropical Marine Science Institute (TMSI) of the University. Most relevant example is the development of ocean forecasting system for South China Sea, comprised of modified wind-wave model WAM and ocean circulation model POM. The system has been operational for a number of years with the wind forecast retrieved from a regional weather forecasting model and NCEP database. After 2004 Indian Ocean Tsunami TMSI has developed Singapore Tsunami Warning System contributing information to countries around Indian Ocean Rim. Other ongoing research and development efforts include the implementation of wind-wave model Wavewatch and storm surge model for the South China Sea.

5. DEVELOPMENT OF THE PILOT PROJECT DOCUMENT

13. Extensive discussions were prompted on the importance of this project, scientific uncertainties to be addressed for several oceanographic processes, funding opportunities and the need for outreach materials. The meeting appreciated the report of Dr. Fangli Qiao which indeed provided a comprehensive basis for the development of the project document with the clearer justification from scientific and social-economic needs, the identification of demonstration areas, suggested key scientific issues to be addressed at this initial phase, and proposed activities.

14. With the outline for project document agreed upon, the meeting was then divided into three sessional groups, further considering the inputs respectively from national perspective and regional perspective.

15. After reviewing all inputs provided, the meeting decided to set up one Drafting Group led by Prof. Fredolin Tangang with members of Prof. Mohd Lokman Husain, Dr. Liew Juneng, Mr. Loy Kak Choon, Dr. Anukul Buranapratheprat and Dr. Patama Singhruck. The meeting also agreed upon the following timeline for the development of the Project Document as follows:

16. Taking into full accounts the suggestions made at the meeting, Prof. Fredolin will further refine the outline of Project document with “bullet points” contained, and then distribute it to all drafting members of Drafting Group within one week after the closure of this meeting (9 October 2010);

17. Based on the inputs from all drafting members, the Drafting Group will complete the first draft one month after the closure of this meeting and distribute to all other project steering members (Dr. Somkiat, Dr. Fangli, Prof. Mohd Lokman and Mr. Wenxi) for further comments (30 October 2010). Upon receiving the first draft, all project steering members shall review and provide their inputs as soon as possible to ensure the finalization of this Project Document by Prof. Fredolin within two weeks after the first draft is distributed.

6. INTER-COMPARISONS WITH OTHER OCEAN CIRCULATION MODELS

18. Dr. Somkiat briefly raised the issue of inter-comparison among different model in the Indian Ocean and SEA region, which was raised from one workshop on “Ocean Forecasting Project for IOGOOS and SEAGOOS” in Perth, Australia, July 9-10, 2010. It was suggested that the WESTPAC’s SEAGOOS consider the possibility of incorporating the inter-comparison among different ocean circulation models into its pilot project on Ocean Forecasting Demonstration. Three ocean circulation models are suggested to be used as boundary conditions for the Southeast Asian regions, which include the wave-tide-circulation coupled model (used for the SEAGOOS Pilot Project), the Indian (IOGOOS) model and the Australian BLUElink.

19. This issue generated in-depth discussion on the feasibility of the inter-models comparison with due consideration of the present progress made on the SEAGOOS pilot project on Ocean Forecasting Demonstration. The meeting took note of the discussion made in Perth, Australia, 9-10 July 2010 on the inter-comparison among different models in the Indian Ocean and SEA. However, considering that the organization and implementation of the inter-comparison will be scientifically meaningful only if some progresses and/or results are made from this pilot project and other models in question, the meeting concluded that the priority for this SEAGOOS pilot project shall be given to the implementation of the pilot project at least within the first two years, and the possibility of inter-comparison shall be considered at a later stage. To this end, the meeting also suggested communications be kept with the Australia-BLUElink group and IOGOOS at any appropriate occasions, for instance the 8th WESTPAC International Scientific Symposium to be held in March 2010.

20. The meeting highly appreciated the tremendous efforts made by Dr. Somkiat, SEAGOOS Coordinator and Mr. Wenxi Zhu, Head of WESTPAC Secretariat in seeking possible collaboration with other regional GOOS, and further reiterated that all SEAGOOS associated activities, including the inter-comparison, shall be led by and coordinated within the framework of the WESTPAC, mainly through SEAGOOS Coordinator in close consultations with the WESTPAC Secretariat.

7. OTHER MATTERS

21. No other matters were discussed under this agenda item.

8. CLOSURE

22. All participants extended their appreciations to Dr. Somkiat and PMBC for hosting this workshop and expressed their satisfaction on the outcome generated from this workshop. Dr. Somkiat, SEAGOOS Coordinator and Mr. Wenxi Zhu, Head of WESTPAC Secretariat thanked all participants for their expertise provided throughout this workshop and expected the pilot project will be implemented smoothly in the near future with the spirit of cooperation and enthusiasm of all team members.

23. The workshop closed at 14:00, on Friday, 1 October 2010.

ANNEX I

UNESCO/IOC SUB-COMMISSION FOR THE WESTERN PACIFIC
(WESTPAC)

First Workshop of IOC Sub-Commission for the Western Pacific on its SEAGOOS Pilot Project on Ocean Forecasting Demonstration

Phuket, Thailand, 30 September - 1 October 2010

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ANNEX II

First Workshop of IOC Sub-Commission for the Western Pacific on its SEAGOOS Pilot Project on Ocean Forecasting Demonstration

Phuket, Thailand, 30 September - 1 October 2010

WORKSHOP PROGRAM AND GENERAL PROJECT CONCEPT

Thursday 30 September 2010

0815-0830	Registration
0830-0900	Welcome address • Mr. Wannakiat Thubthimsang, Director of the Phuket Marine Biologic Center; • Mr. Wenxi Zhu, Head of UNESCO/IOC Regional Secretariat for the Western Pacific
0900-0920	Overview of project history and workshop objectives. Prof. Fredolin Tangang
0920-0940	The Malaysian component of the project (Prof. Fredolin Tangang/Prof. Mohd. Lokman Husain)
0940-1000	The Thailand component of the project (Dr Somkiat Khokiattiwong)
1000-1030	China experience in development of ocean forecasting system and the roles it can play in the project (Prof. Fangli Qiao)
1030-1100	Morning Tea
1100-1120	Singapore's experience in the Development of Ocean Forecasting System
1120-1145	Open forum discussion to review and finalise workshop objectives. Chaired by Prof. Fredolin Tangang. Plus a rapporteur to record outputs.
1145-1230	Open forum discussion. Specification of specific objectives for each respective sub-regional demonstration area. This will result in the

	identification and documentation of the particular aspirations for each sub-region, in respect to what each sub-region wishes to achieve through the project.
	Peninsular Malaysia's eastern shelf (Malaysia)
	Gulf of Thailand (Thailand)
1230-1400	Lunch
1400-1530	Open forum discussion
	Development of the overall project plan for the project.
1530-1600	Afternoon Tea
1600-1700	Open forum discussion.
	Continued -Development of the overall project plan for the project.
1800	Dinner

Friday 1 October 2010

0900-1030	Recap on the previous day's work and results and identification of generic issues that arise and require resolution. Mr Wenxi / Prof. Fredolin / Dr Somkiat/Prof. Fangli Qiao
	Open forum discussion
	Continued -Development of the overall project plan for the project. This will be done, section by section, sub-region by sub-region, with the input of all in a collegiate manner.
1030-1100	Morning Tea
1100-1230	Drafting of the overall project plan for the project, based on the draft project pro-forma prepared for the workshop. This will be done by a small editing group, to be selected at the meeting.
1230-1400	Lunch

1400-1500	Presentation and revision of the draft project plan by editing group.
1500-1530	Afternoon Tea
1530-1700	Open forum discussion on the way forward for inter-models comparison and collaboration with BLUElink and IOGOOS
1700-1715	Closing (Mr Wenxi Zhu)

General project concept and background information:

- Ocean forecast system can provide crucial information of ocean circulation, sea surface temperature, ocean surface wave, sediment and marine organisms (larvae or planktonic form) transport and also for activities related to oil and gas exploration, fisheries, navigation, marine parks management and coastal recreational activities.

- However, an operational ocean forecast system is yet to be developed in the Western Pacific region. In particular, generally regional capacity for ocean forecasting in the Southeast Asian region is still at infancy. There is a need to develop regional capability and capacity for improved ocean forecasting in the region. To this end, the IOC Sub-Commission for the Western Pacific (IOC/WESTPAC) established, within its SEAGOOS program, one pilot project entitled "Ocean Forecast Demonstration" at its Eight Intergovernmental Session of the IOC Sub-Commission for Western Pacific (WESTPAC-VIII). This project is proposed and headed by Prof. Fredolin Tangang of Malaysia. This pilot project will be developed initially based on existing cooperation among Malaysia, Thailand and China and further expanded to accommodate more participating countries who are willing to join. The initial members of the Project Steering Group include Prof. Fredolin Tangang (Malaysia), Prof. Fangli Qiao (China) and Dr Somkiat Khokiattiwong (Thailand).

- This project will demonstrate the value of ocean forecasting system initially on the Peninsular Malaysia's eastern shelf and Gulf of Thailand, through the development of wave-tide-circulation coupled numerical model for the two sub-regions. The wave-tide-circulation model is developed by the First Institute of Oceanography (FIO) in which the wave model is the MASNUM wave model developed by the FIO whereas the circulation model is based on the Princeton Ocean Model (POM). With involvement of the FIO, this project will facilitate the transfer of technology to participating countries. The FIO will also be supplying relevant boundary conditions for the forecast system.

- The objectives of this proposed project are 1. To develop an ocean forecasting system for Peninsular Malaysia eastern's shelf and Gulf of Thailand, 2. To enhance understanding of oceanographic processes in the region, 3. To facilitate the establishment of ocean numerical modeling groups in Malaysia and Thailand, 4. To provide a platform for ocean modelers, especially young scientists, from this region to network and share their findings and interests.

- To achieve this, this meeting aims to come up with a practical implementation plan of the project through in-depth discussions on several key issues, such as funding, joint cruises, ocean modelling training workshops, etc,

- Meanwhile, SEAGOOS has been exploring collaborations with other adjacent regions on ocean forecast by examining different ocean forecasting systems to deliver maximal societal benefit, such as the Indian (IOGOOS) model and the Australian BLUElink. At one workshop on "Ocean Forecasting Demonstration Project for IOGOOS and SEAGOOS" hosted by UNESCO IOC Perth Regional Programme Office, July 9-10, 2010, it was suggested that the IOC/WESTPAC's SEAGOOS consider the possibility of incorporating the inter-comparison among different ocean circulation models into its pilot project on Ocean Forecast Demonstration. Three models are suggested to be used as boundary conditions for the Southeast Asian regions, which include the wave-tide-circulation coupled Model (used for SEAGOOS Pilot Project on Ocean Forecasting Demonstration), India model/IOGOOS and Australia/BLUElink.

- Hence, during the workshop (September 30 - October 1, 2010), in addition to detailed discussion on implementation plan of the projects, the possibility of the inter-models comparison will also be discussed among the participating members of this pilot project. The decision to be made will form the basis for future collaboration with IOGOOS and BLUElink.