



**UNDP/GEF PROJECT ENTITLED “REDUCING ENVIRONMENTAL STRESS IN THE
YELLOW SEA LARGE MARINE ECOSYSTEM”**

UNDP/GEF/YS/RWG-E.4/5
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English only

**Fourth Meeting of the Regional Working Group
for the Ecosystem Component**
Ningbo, China, 3-5 October 2007

Completed Activities of the Ecosystem Component in the Past Year

1. Ecosystem Component-relevant activities completed during the past year are described below.

Agenda 5.1

First Yellow Sea Regional Science Conference

2. The “First Yellow Sea Regional Science Conference” (RSC) was held from 14-16 August 2007 in Hangzhou, China. Oral and poster presentations were given, focusing on the current knowledge of the ecosystem’s provisioning, regulating, and cultural services. The presentations explained the status of the services with respect to fisheries, mariculture, biodiversity, pollution, and overall ecosystem structure and function. They also discussed the implications of those ecosystem services for society and economy in the region. The conference contributed to the Project’s Strategic Action Programme (SAP) goal to maintain and improve the “Carrying Capacity of Ecosystem” in the Yellow Sea.
3. During the conference summary given by the Chairperson of the Conference Organising Committee, participants were asked to contribute ideas for future directions in management of the physical, chemical and biological environments; enhancement of cultural services; and incorporation of legislative, political and institutional issues into management.
4. The contributions were considered during the 2nd SAP Ad-hoc Working Group Meeting held immediately after the RSC, when experts were asked to provide management actions for their responsible sections. Some suggestions from the RSC were incorporated into the SAP Meeting’s outcomes. During Agenda 6, members will be invited to review the management actions and other SAP-associated activities.

Agenda 5.2

CPR Survey

5. The continuous plankton recorder (CPR) was purchased by the project in 2006 and is kept at FIO. Some of the FIO staff were trained in the use of the equipment by the manufacturer and also through a training course held in USA last year. The CPR was then deployed in spring 2007 for a short survey in the Yellow Sea.

6. The representative from FIO will report on the results on the survey.

Agenda 5.3

Ocean Colour Algorithm

7. This activity was contracted to Tohoku University, Japan, as the overall co-ordinator to bring together scientists from Japan, Republic of Korea, and China to share relevant data to develop and/or refine an algorithm for Yellow Sea turbid waters.
8. Two OC workshops were held in June (Ansan, ROK) and September (Nagasaki) 2007. In the first workshop, scientists presented their data and discussed the plan to proceed in OC algorithm development. The PMO established a data server for scientists to upload and exchange their data with each other. PMO also merged the contributed data sets into one common data set with search functions.
9. At the second workshop, scientist involved in the activity reviewed the submitted data, discussed some current algorithms, and some ways to verify the data and algorithms. It was discovered that the common data set had some problems, as data from different persons were not uniform, or the methods of sample/data analysis were different.
10. It was agreed that the data set should be expanded to include additional variables (CDOM(400) and (440), slope, temperature, salinity). PMO revised the database accordingly. It was also agreed that some group members should provide additional data not yet shared.
11. The final workshop where the outputs will be delivered will be held either in December 2007 or early January 2008.
12. The RWG-E Chairperson who is also a member of the activity, will report further on the progress-to-date of this activity.

Agenda 5.4

Primary Productivity Estimation

13. Following the discussion and agreement from the last RWG-E Meeting, a fast repetition rate fluorimeter (FRRF) was purchased by the project and will be kept at KORDI when the equipment is built. An activity to estimate primary productivity will be initiated with the RWG-E Chairperson taking the lead. The Chairperson will report on this activity. The proposal for the activity is attached as [Annex I](#).

Annex I

Proposal for Assessment of Primary Productivity of the Yellow Sea Ecosystem in relation to Carrying Capacity

Background

Primary productivity of the Yellow Sea is important in the two respects: 1) Potential biological production, and 2) water quality issues. Among many approaches to estimate potential food production, assessment and monitoring of primary production is crucial as it provides information of energy input at the basis of the food web. This knowledge is important in assessing the carrying capacity of the Yellow Sea ecosystem. The carrying capacity will change in the face of changing climate and anthropogenic influence. The processes and factors of primary production will also be used as a guideline for water quality management in relation with nutrient budget and control. Despite its importance, primary production or carrying capacity based upon it has not been assessed for the Yellow Sea ecosystem in basin scale, basically due to the lack of appropriate technologies. With the advent of remote sensing technology, we have now better assessment methods of basin-scale primary production (Son et al., 2005) or long-term changes in the primary productivity in the Yellow Sea (Son et al., 2005).

To overcome limitations and to produce useful estimates of primary productivity of the Yellow Sea ecosystem, two major breakthroughs are still needed. First, a validated algorithm with reasonable accuracy should be developed for the Yellow Sea. The Yellow Sea Ocean Color Group sponsored by YSLME and IOC/WESTPAC will provide a breakthrough in the chlorophyll algorithm development. Second, a good primary production algorithm is necessary which is built upon measurements in turbid regions (tidally mixed areas of the YS) where lack of photosynthesis parameters is a serious hindrance. Therefore a research activity is needed to produce primary productivity maps and estimates by utilizing the output of Yellow Sea Ocean Color Group and by making measurements in turbid waters. This will be the first major attempt to estimate the primary productivity of the Yellow Sea ecosystem.

Objectives

- 1) To develop regional primary production algorithm that can be used for long-term monitoring
- 2) To provide a baseline assessment of potential productivity of the Yellow Sea
- 3) To generate field bio-optic data to assist the development of chlorophyll algorithms planned for the Remote Sensing Workshop (YSLME-IOC/WESTPAC).

Activities

- A) In-situ measurements in turbid waters (minimum 15 stations)
 - 1) Bio-optics
down-welling irradiances and upwelling irradiance at more than 7 bands
chlorophylls, HPLC pigments, particulate absorption, CDOM
 - 2) Photosynthetic parameters
ETR (electron transfer rate), I_k, P-E relationship.
- B) Estimation of depth-integrated primary production

C) Developing primary production algorithm in turbid waters

D) Processing and Mapping of satellite chlorophyll (using the algorithm developed by Yellow Sea Ocean Color Group)

E) Mapping of primary production

Outputs

- Monthly maps of primary production of the whole Yellow Sea
- Annual map of primary production (at 4km resolution)
- Interannual variability of primary production of the Yellow Sea

	1	Begin procurement of equipments Procure expendables
Timeline:		End of Aug
	2	Conduct field research
Timeline:		by End of Nov
	3	Obtain case 2 algorithms from YSOC group activity
Timeline:		by Dec 31
	4	Complete sample and data analysis
Timeline:		by Jan 31, 2008
	6	Develop regional primary productivity algorithm
Timeline:		By Feb 28, 2008
	7	Produce maps of primary production in the Yellow Sea
Timeline:		By March 31, 2008
	8	Submit final report
Timeline:		By April 15, 2008