

## Pilot assessment on the impacts of major threats to marine biodiversity in the selected sea areas in the NOWPAP region

### 1. Background

CEARAC is responsible for coordination of regional activities for assessment of the state of the marine and coastal environments. In view of this, CEARAC has developed “Procedures for assessment of eutrophication status including evaluation of land-based sources of nutrients for the NOWPAP region (the NOWPAP Common Procedure)” and applied it in some selected case study areas in the region.

In 2010, CEARAC has started an activity on marine biodiversity conservation. CEARAC tried to develop a new marine environmental assessment method for marine biodiversity conservation. However, there existed gaps on data availability among the member states; therefore, it was required to set common assessment indicators at first, based on the data availability in the member states.

Then, as the first step, CEARAC focused on marine protected areas (MPAs) in the NOWPAP region, which are established in respective member states under their national regulations, and implemented an activity for preparing a regional report on monitoring and management status of MPAs in the NOWPAP region in the 2012-2013 biennium. As the second step, CEARAC proposed a new activity “Pilot assessment on the impacts of major threats\* to marine biodiversity in selected sea areas in the NOWPAP region” at the 11<sup>th</sup> CEARAC FPM (September 2013). This project focuses on the impact of major threats on marine biodiversity and tries to clarify data availability on major threats in the member states. It was agreed to propose CEARAC workplan for the 2014-2015 biennium including this activity to the 18<sup>th</sup> NOWPAP IGM (December 2013). The entire workplan was approved by correspondence by the member states in April 2014.

*\*At the beginning of this biennium, CEARAC Secretariat use “threat” for this activity. However, “threat” is strong wording, and “pressure” is basically used in UNEP/CBD reports. Therefore, CEARAC Secretariat use the word “pressure”.*

### 2. Objective

The objective of this project is to clarify available data on major pressures to marine biodiversity: eutrophication, non-indigenous species and habitat alteration in each member state and understand the current situation of pressures using the available data. The output of this project is a regional report which includes not only status of pressures but also possible components, data requirements and methodologies for future development of a new assessment tool for marine biodiversity conservation.

### 3. Tasks

#### (1) Selection of target sea areas for pilot assessment

Based on data availability on eutrophication, non-indigenous species and habitat alteration, each

member state selected sea areas from the areas which are significant for marine biodiversity conservation to conduct a pilot assessment. Selected sea areas are as follows;

China: Coastal area of Yantai and Dalian

Japan: North Kyushu sea area and coastal area of Hokuriku region

Korea: Masan Bay (including Jinhae Bay area) and Sihwa Lake

Russia: the Peter the Great Bay

#### (2) Nomination of experts who implement pilot assessment

CEARAC FPs nominated the following experts who implement pilot assessment in the selected sea areas of each member state;

China: Dr. Bei Huang

Japan: NPEC

Korea: Dr. Young Nam Kim

Russia: Dr. Tatiana Orlova

#### (3) Implementation of pilot assessment

CEARAC Secretariat contracted with above experts to implement pilot assessments. Each expert collected available data on eutrophication, non-indigenous species and habitat alteration in each selected sea area and assess the current status of each pressure using available data.

The national report on pilot assessment in China, Japan and Russia have submitted to CEARAC Secretariat. However, Korean report has not been submitted yet (as of end of July, 2015).

#### (4) Preparation of regional report

Based on the submitted national reports, CEARAC Secretariat summarizes them and prepares a draft regional report. This regional report includes data inventory (Annex 1) of available data on eutrophication, non-indigenous species and habitat alteration, and the current status of three pressures in each selected sea area. In addition to the results of pilot assessment, recommendation on potential common indicators to be used and future assessment method of major pressures on marine biodiversity will also be included. Contents of the draft regional report are as follows;

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After review of the draft report by the nominated experts and CEARAC FPs, the report will be refined and shared with NOWPAP National FPs for final agreement of publication. The regional report will be published by the end of 2015.

#### (5) Organization of workshop

A PICES-NOWPAP joint workshop “Identifying major threats to marine biodiversity and ecosystems in the North Pacific” will be held during coming PICES 2015 Annual Meeting, Qingdao, China (Oct. 14-25). The joint workshop is a one day meeting: the morning session is reporting NOWPAP activities and the afternoon session is presentation of other participants. The experts who have implemented CEARAC’s pilot assessment will participate in the joint workshop and report the results of their pilot assessment. During the workshop, future collaboration between PICES and NOWPAP will be discussed.

**4. Schedule**

Time		Actions	Main Body
2014	April	The first Extraordinary IGM Approval of Program of Works and budget for the 2014-2015 biennium	NOWPAP National FPs
	2-3 July	12 <sup>th</sup> CEARAC FPM - Review and approval of workplan - Nomination of experts - Selection of target sea areas	CEARAC FPs and Secretariat
	July	Contracting MoU with experts	Experts and Secretariat
	Aug- Feb 2015	Implementation of pilot assessments	Experts
2015	March	Submission of national reports on pilot assessments from member states	Experts
	Q2-Q3	Preparation of a draft regional report	Secretariat
	August	Expert meeting - Report of pilot assessment - Review of draft regional report	Experts and Secretariat
	August	13 <sup>th</sup> CEARAC FPM - Review of the draft regional report - Approval of workplan for the 2016-2017 biennium	CEARAC FPs and Secretariat
	October	PICES-NOWPAP Joint Workshop	Experts
	Q4	- Review of draft regional report by National FPs - Publication of regional report	NOWPAP National FPs

**5. Budget**

Task	Budget (US\$)	
Organization of workshop	10,000	
Preparation of a regional report on the impacts of major pressures to marine biodiversity in the NOWPAP region	<del>2,000</del> 5,000	
Implementation of pilot assessment	China	3,000
	Japan	<del>3,000</del> In-kind
	Korea	3,000
	Russia	3,000
Total	24,000	

Main Categories	Assessment parameters	Data availability	Contents of data	Sea area where data is available		Period of data	Monitoring frequency
				Dalian	Yantai		
Eutrophication	Total nitrogen/Total phosphorus	N					
	Dissolved Inorganic nitrogen/phosphorus	A	Concentration of DIN and DIP	✓	✓	2003-2013	Once/year
	Use of fertilizer	A	Agricultural consumption of chemical fertilizer	✓		2003-2006, 2013	Once/year
	River input of nutrient	N					
	Chlorophyll a	N					
	Nutrients input from feeding in aquaculture	N					
	Nutrients input from fertilizer	N					
	Land use	N					
	Population	A	Population and population density	✓	✓	2003-2013	Once/year
	Water quality	A	Concentration of SS, DO, COD and oils	✓	✓	2004-2013	Once/year
	Bottom environment	N					
	Red tide occurrence	N					
	Hypoxia	N					
	Total volume of industrial waste water discharge	A	Sulfide in bottom	✓		2003-2013	Once/year

Main Categories	Assessment parameters	Data availability	Contents of data	Sea area where data is available		Period of data	Monitoring frequency
				Dalian	Yantai		
Non-indigenous species	Number of NIS	N					Once
	Distribution of NIS	N					-
	Aquaculture of NIS	A	Area and production of <i>Argopecten irradians</i>	✓		2004, 2005	Once/year
	Foreign ship	N					
	Endangered species	N					
	Protected species	A	Number of spotted seal		✓	2002, 2004, 2008, 2012	Once/year
	Maritime passenger transport	A		✓	✓	2004-2012	Once/year
	Port cargo	A		✓	✓	2004-2012	Once/year
	Number of berthing vessel	A			✓	2003-2010	Once/year
	Natural coast	N					
Habitat alteration	Landfill area	N					
	Dredging	N					
	Warming water discharge	N					
	Number of dam	N					
	Water quality	N					
	Bottom environment	N					
	Volume of fixed asset investment	A			✓	2003-2013	Once/year
	Seaweed/seagrass area	N	-				
	Marine species	A	Number and density of species of phytoplankton and benthos	✓	✓	2012-2014	Once/year
	Biodiversity	Marine Trophic level	N				
Fish catches		A	Volume	✓	✓	2003-2013	Once/year
Fish catches		A	Value	✓	✓	2003-2013	Once/year
Aquaculture of NIS		A	Production	✓	✓	2003-2013	Once/year
Aquaculture of NIS		A	Area	✓	✓	2003-2013	Once/year

Main Categories	Assessment parameters	Data availability	Contents of data	Sea area where data is available					Period of data	Monitoring frequency	Monitoring Organization
				Niigata	Toyama	Ishikawa	Fukuoka	Saga			
Eutrophication	Total nitrogen/ Total phosphorus	A	Concentration of T-N and T-P (Only sea surface data in several sea area)	✓	✓	✓ (Kanazawa Bay, Nanao Bay)	✓ (Hakata Bay, Dokai Bay, Suou-Nada Sea, Hibiki-Nada Sea, Chikuzen Sea)	✓ (Karatsu Bay, Imari Bay, Genkai Sea)	-2012	4-12 times/year	Local government MLIT
	Dissolved Inorganic nitrogen/phosphorus	A	Concentration of DIN and DIP (Only sea surface data in several sea area)	✓ (Ryoutsu bay, DIN)	✓ (DIN)	✓ (Nanao bay)	✓ (Hakata bay)	✓ (Katatsu, Imari, Genkai)	-2012	4-12 times/year	Local government MLIT
	River in/out of nutrient	A	River discharge T-N, T-P	✓	✓	-	-	✓	-2012	2-4 times/year	Local government MLIT
	Chlorophyll a	A	Concentration of chlorophyll a	-	✓	-	✓ (Hakata bay, Dokai bay, Suo-nada sea, Hibiki-nada sea)	✓ (Karatsu, Imari, Genkai)	-2012	2-4 times/year	Local government MLIT
	Use of fertilizer	A	Shipping volume of inorganic fertilizer	✓	✓	✓	✓	✓	-2010	-	
	Aquaculture	A	Production	✓	✓	✓	✓	✓	-2013	Once/year	MAFF
	Aquaculture	A	Feed dosage	✓	✓	✓	✓	✓	-2012	Once/year	MAFF
	Aquaculture	A	GIS information	✓	✓	✓	✓	✓	-	-	JCG
	Land use	A	Area of landuse	✓	✓	✓	✓	✓	1976, 1987, 1991, 1997, 2006	-	GSI
	Population density	A	Population density	✓	✓	✓	✓	✓	-2010	Once/5 years	MIC
	Water quality	A	Transparence	✓	✓	-	✓ (Hakata bay, Dokai bay, Suo-nada sea, Hibiki-nada sea, Chikuzen sea)	✓ (Katatsu, Imari, Genkai)	-2012	4-12 times/year	Local government MLIT



Main Categories	Assessment parameters	Data availability	Contents of data	Sea area where data is available						Period of data	Monitoring frequency	Monitoring Organization
				Niigata	Toyama	Ishikawa	Fukuoka	Saga				
Eutrophication	Water quality	A	Dissolved oxygen	✓	✓	✓	(Hakata bay, Dokai bay, Suonada sea, Hibikinada sea, Chikuzen sea)	✓ (Karatsu, Iman, Genkai)	-2012	4-12 times/year	Local government MLIT	
	Water quality	A	Dissolved oxygen	-	-	-	(Hakata bay)	-	-2012	12 times/year	Fukuoka City	
	Bottom environment	A	Sulfide in bottom	-	-	-	(Hakata bay, Karatsu bay)	✓ (Kariya bay, Karatsu bay)	-	1-2 times/year	Local government MLIT	
	Bottom environment	A	Sulfide in bottom	-	✓	-	-	-	2011	Once/5 years	Toyama Pref.	
	Number of red tide occurrence	A (Permission)	Red tide occurrence	-	-	-	✓	✓ (Inner bay area)	-	-	Saga Pref., Fukuoka Pref.	
	Number of hypoxia	N	-	-	-	-	-	-	-	-	-	
	Number of NIS	A	Number of species	✓	✓	✓	✓	-	2006-2011	Once	Prof. Iwasaki	
	Existence of NIS	N	-	-	-	-	-	-	-	-	-	
	Discharge of ballast water	A	Number of foreign ship	✓	✓	✓	✓	✓	-2012	Once/year	MLIT	
	Aquaculture of NIS	A	Seed release	✓	✓	✓	✓	✓	-2011	-	FRA	
Endangered species	A	Species name	✓	✓	✓	✓	✓	-	-	FA		

Main Categories	Assessment parameters	Data availability	Contents of data	Sea area where data is available					Period of data	Monitoring frequency	Monitoring Organization
				Niigata	Toyama	Ishikawa	Fukuoka	Saga			
Habitat alteration	Reclamation area	A	Area	✓	✓	✓	✓	✓	1989-1977-1983	Once/year	GSI
	Reclamation area	A	Area	✓	✓	✓	✓	✓	1977-1983	-	MOE
	Natural coast	A	Length of natural coast	✓	✓	✓	✓	✓	1997-1998, 1997-2001	-	MOE
	Collection of sea sand	A	Volume of collection	✓	✓	✓	✓	-	-	-	-
	Coastal construction	A	Kinds of construction	✓	✓	✓	✓	✓	2012	-	MILT
	Number of dam	A	Location, detail information	✓	✓	✓	✓	✓	2005	-	MILT
	Water quality (temp.)	A	Sea surface temperature	✓	✓	✓	✓	✓	-2012	6times/year	Local government
	Water quality (Sal.)	A	Chloride ion	✓	-	-	-	-	-2012	6-12 times/year	Niigata Pref.
	Bottom sediment	A	Grain size	-	-	-	-	✓	-2012	1-2 times/year	Fukuoka Pref.
	Bottom sediment	A	Grain size	-	✓	-	-	-	2011	Once/5 years	Toyama Pref.
Biodiversity	Scosystem service	N	-	-	-	-	-	-	-	-	-
	Fish catches	A	Volume	✓	✓	✓	✓	✓	1956-	Once/year	MAFF
	Seaweed/seagrass area	A	Area	✓	✓	✓	✓	✓	1997-2001	-	MOE
	Seaweed/seagrass area	A	Area	-	✓	-	-	-	2011	Once/5 years	Toyama Pref.
	List of species	A	Name of species	✓	✓	✓	✓	-	-	-	-
	List of species	A	List of benthos	-	✓	-	-	-	2011	Once/5 years	Toyama Pref.
	List of species	A	List of periphyton	✓	-	-	✓	✓	2009/12-2010/02	Once	NILIM
				(Niigata bay)	-	-	-	✓	-	-	-

Main Categories	Assessment parameters	Data availability	Contents of data	Sea area where data is available				Period of data	Monitoring frequency	Organization
				Amursky Bay	Ussurisky Bay	East part of PGB	South part of PGB			
Eutrophication	Total nitrogen/Total phosphorus	A	Annually averaged concentration of T-N, T-P	✓	✓	✓	✓	2000-	2-8 times/year	FSBIPAHEM Institute of FEBRAS, FEFU
	River input (T-N, T-P)	A	Averaged concentration	✓	✓	✓	✓	2000-	2-8 times/year	FSBIPAHEM Institute of FEBRAS, FEFU
	Use of fertilizer	A	Overall use in the region							ROSSTAT
Non-indigenous species	Number of NIS	A	Species identification, abundance	✓	✓	✓	✓	2000-	2-8 times/year	Institute of FEBRAS TINRO Center
	Distribution of NIS	N								
Habitat alteration	Natural coast	A	Length of natural coast line	✓	✓	✓	✓	2000-	Upon request	Expert assessment
	Landfill area	N								
Biodiversity	Seaweed/seagrass area	A	Species identification, abundance, distribution	✓	✓	✓	✓	2000-	Upon request	Institute of FEBRAS TINRO Center
	Marine species	A	Species identification, abundance, distribution	✓	✓	✓	✓	2000-	2-8 times/year	Institute of FEBRAS TINRO Center
	Marine Trophic level	A	Species identification, abundance, distribution	✓	✓	✓	✓	2000-	2-8 times/year	Institute of FEBRAS TINRO Center FEFU