

Summary of National Report on HABs in Russia

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Introduction

Microalgae in marine and brackish waters regularly cause “harmful effects”, considered from the human perspective, in that they threaten public health and cause economic damage to fisheries and tourism. Harmful Algal Blooms include discoloration of water by mass occurrences of microalgae (true algal blooms that may or may not be ‘harmful’) and toxin-producing species (toxic “blooms” that may be harmful even in low cell concentrations). The solution of HAB problems in the NOWPAP Region needs close coordination within WG members in this Region. It is essential to have a common platform to develop the research, mitigation measures and proper political proposals. In accordance with the definition of HAB that was agreed by WG3 Members at the meeting in Busan, October 2003, HABs in this report encompass both harmful and harmless red tides, and toxin-producing plankton blooms. According to requirement of the guidelines, the report was prepared using both existing and publishing data.

Russian part occupied a vast zone in the north of the NOWPAP region. It is mostly unpopulated area and does not have so intensive aquaculture industry, as it is in other NOWPAP countries.

1.2. Red tide events in Russian part of NOWPAP region

Two types of HAB are known in Russian coastal waters. The first type is “red tide”, in which the water is discolored by high algal biomass. The second type is blooming of toxin-producing phytoplankton. The chapter introduces situation on Red tide occurrence in Russian waters based on data recommended by guideline. The data on Situation of Red tide is originated from publications of the Institute of Marine Biology of Far Eastern Branch of Russian Academy of Sciences (IMB FEB RAS). A total of 23 red tide events were observed during 1992–2002 in Russian coastal waters (Fig.1). All 23 red tide events were harmless. No any cases of human poisoning or mass mortality of fish and shellfish were A total of 12 species caused red tides in Russian coastal area during 1992 to 2002. Those species are belonging to 5 taxonomic groups of phytoplankton: cyanophytes, dinoflagellates, diatoms, raphidophytes and euglenophytes. Dinoflagellates are the most common bloom-forming algae in Russian coastal waters and caused 10 red-tide events. *Noctiluca scintillans* has caused most of the visible red tides recorded in Russian coastal waters discoloration.

Registrations of red tide events in Russia in 1992-2002 were conducted by: Laboratory of the Ecology of Shelf Communities of Institute of Marine Biology of the Far Eastern Branch of Russian Academy of Sciences. Only this laboratory is reported to carry out red tide observations in Russian coastal waters. Laboratory of the Ecology of Shelf Communities IMB FEB RAS carries out the HABs observations both in the coastal waters of Primorye and in the coastal waters of South Sakhalin Island. Study areas are small and limited to enclosed bays. Red tides events were registered sporadically. Data is reported in this chapter based on different schemes of sampling. It is, therefore, impossible to draw a map on annually and monthly basis.

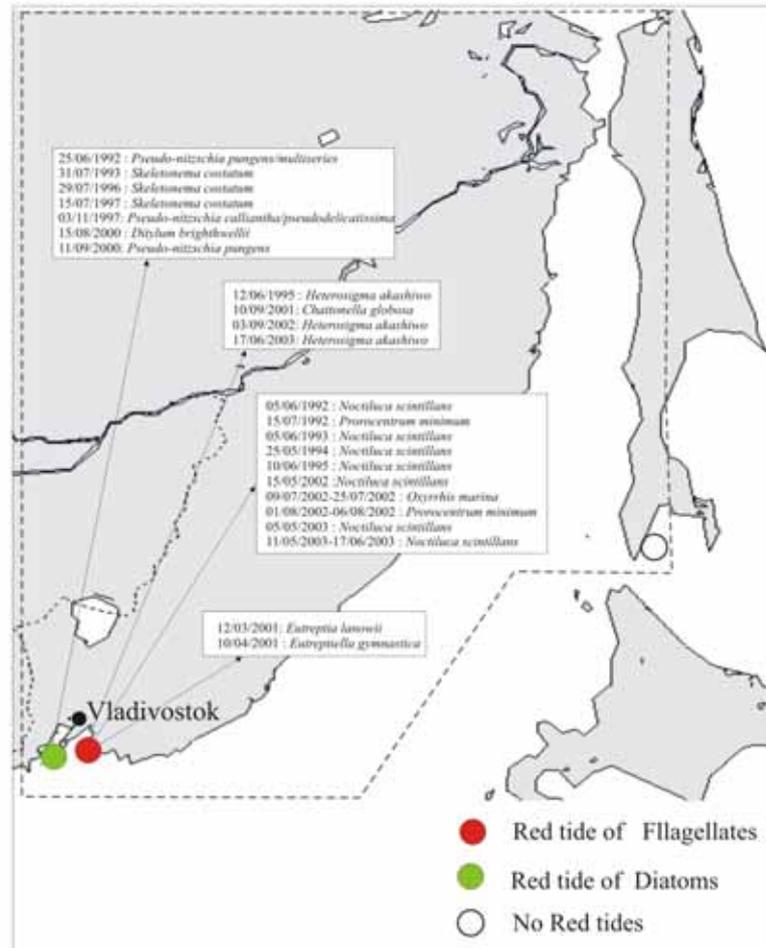


Fig. 1. HAB events in Russian part of NOWPAP area during 1992-2002.

1.2. Toxin producing Plankton

This chapter introduces situation on potentially toxic species, which observed in Russian coastal waters within the NOWPAP region and known to be toxic in other NOWPAP countries. Some microalgae have ability to produce potent toxins that can find their way through the food chain to humans, causing a variety of gastrointestinal and neurological illnesses, such as Paralytic Shellfish Poisoning (PSP), Diarrhetic Shellfish poisoning (DSP) and Amnesic Shellfish Poisoning (ASP). Data on occurrence and maximum density of species which are known as producers of toxin are summarized separately for ASP, DSP and PSP. Results on toxin analysis of cultures of some species are also presented. In Russia, study of potentially toxic plankton has been conducted by two laboratories: Laboratory of the Ecology of Shelf Communities of Institute of Marine Biology (FEB RAS) and Laboratory of Hydrobiology of SakhNIRO. Laboratory of the Ecology of Shelf Communities IMB FEB RAS carries out the observations on potentially toxic species since 1992. Laboratory of Hydrobiology SakhNIRO started toxin-producing plankton observations in the coastal waters of Sakhalin Island since 2003 year.

2. Monitoring

This chapter describes briefly the situation with monitoring of HAB in Russia, namely the absence of governmental organization responsible for toxin-producing plankton monitoring and monitoring on shellfish poisoning fishery products. As results there are no official (governmental) data on toxin-producing plankton and toxicity of seafood in Russian waters, belonging to the NOWPAP region, and data of research organizations are used for the monitoring. Thus, some Russian data on HAB in the NOWPAP area has not sufficient for the completion of recommended format for Integrated report. Nevertheless, the present report can be used as the basis to develop the complete understanding on HAB in the NOWPAP Region.

3. Progress of Researches and Studies to Cope with HABs

Present research and studies about HAB in Russian waters are introduced in this chapter. Publications of Institute of Marine Biology of the Far East Branch of Russian Academy of Sciences on the current progress of HAB studies were collected for recognizing the directions of researches and studies of HAB in Russian marine waters in the future.

4. Literature Including Newly Obtained Information

Information of literatures about HAB was obtained by using HAB Reference Database which has been constructed by CEARAC/WG3. Section indexes conform to the categories in HAB Reference Database. Following sections show summaries all papers that are published in Russia after 2000 and stored in HAB Reference Database.

5. Training Activities to Cope with HABs

This section describes the international training courses attended by Russian scientists in 1995-2003. There are no any governmental organizations that have training activity to cope with HAB on Federal or local basis in Russia. Russian scientists have participated in 14 international training courses. Objectives of the training course were improvement of the participant skills in taxonomy, biology and chemistry of harmful microalgae in order to enable them to detect their occurrence and mitigate their harmful effects. The training activity included lectures, laboratory and field practice and focused on improving related human resources as well as technology and knowledge transfer in order to develop capability in WESTPAC countries for management of HAB events. The obtained experience was used in designing and conducting laboratory study and field research on harmful microalgae.

6. National Priority to Cope with HAB

Interviews with researchers and scientists of the relevant field were conducted to collect their ideas on necessary efforts to cope with HABs. The Federal Legislative Act (SanPIN 2.3.4.050-96) concerning of food quality was used for the identification of national priorities. The Federal Legislative Act (SanPIN 2.3.4.050-96) concerning of food quality from the point of view shellfish toxicity has been published in 1996. This Act called “The production of fisheries and shellfish products, sanitary regulations and requirement” and describes maximal permissible concentration of saxitoxin (PSP) as 80 ug/100 g wet mollusk tissue, and analytical absence of oocadaic acid (DSP). Moreover system of plankton monitoring should be implement in the aquaculture and/or catching areas for the control of possible occurrence of toxin microalgae and their density. Control of toxicity must be conducted once per month during winter/spring period and twice per month during summer/fall time. Implementation of administrative measures

and structures providing fulfillment of this legislative basis is a first national priority for the time being in the field to cope with shellfish poisoning and toxicity.

Present level of aquaculture production in Russian Far East is not so advanced as in the other NOWPAP countries, and practical damage from HAB events is not significant so far. Therefore, research activity continues to be in the center of national priorities in HAB problem in Russia.

The monitoring of plankton communities in the key aquaculture areas continues to be the one of the main research field. The determination of short- and long-termed trends in plankton community, and key environmental variables controlling such trends are the main aims.

The influence of land-based sources of nutrients on the HABs occurrence and dynamics should be checked. Cysts analysis is another promising research area because sampling and pretreatment procedure for cysts analysis don't require so high skilled specialists as plankton research. This circumstance enhances possibility to get samples from the different regions that is especially important for the very spacious and rather unpopulated Russian sector of NOWPAP area. Another advantage of cysts analysis is a potential to forecast risk of HAB events and to create the integrated scheme of HABs risk along broad areas.

Arrangement of toxin analysis in the algae cultures and shellfish continue to be among main national priorities, though some progress had been made.

Development and implementation of schemes of observation upon plankton communities using the remote sensing technics should be the one of national priorities in the HABs issues.

Increase of high skilled specialists for the investigation in the biology and ecology of the plankton species leading to HABs events continues to be the national priority also.

7. Suggested Activity for the NOWPAP Region

In accordance with the national priorities in the NOWPAP region on the HAB issues the following activities could be suggested from the Russian side:

The analysis of the harmonized National Report and Integrated Regional Report as well with the aim to highlight new challenges in the environmental issues in the NOWPAP region.

The continuation of the activity connected with creation and support of HAB Reference Database which serves as a basement for the present and future research, monitoring and mitigation measures on HAB issues in the NOWPAP region.

The coordination and methodological adjustment of the remote sensing observations to the HABs research through the scientific meetings and other dissemination methods of results.

In accordance with the necessity to check possible influence of land-based sources on the coastal are, one of the future activities of CEARAC could be research and analysis of the relationships between land-based sources and fluxes and different ecological problems in coastal zone, including HAB issues.

The Government of Russian Federation supports the activities of international organizations related to the problem of HAB. The Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP) and Intergovernmental Oceanographic Commission (IOC) have special activities or programs concerning HAB problems. North Pacific Marine Science Organization (PICES) also has working group concerning about different HAB issues in the different regions of North Pacific.

For the elevation of high skilled personnel the joining to the training courses of different organizations could be recommended to save money and resources. For example, the joint trainings on HAB issues conducted in PICES and IOC format were very successful and could be recommended for the continuation. The including for the schedule of future training more issues connected with arrangement and management of HAB and toxicity monitoring could be recommended and appreciated by Russian experts.