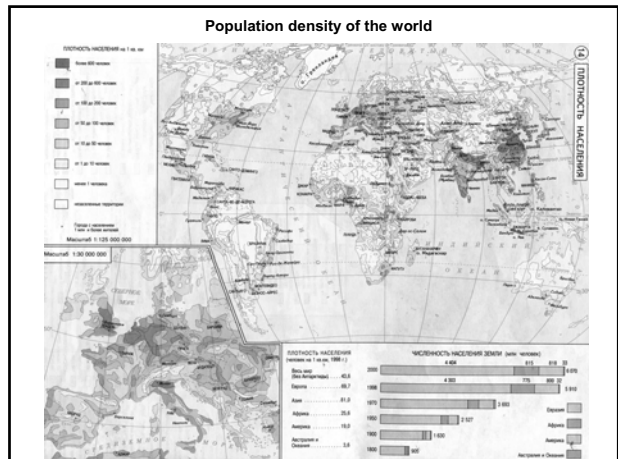


PRINCIPALS OF ARRANGEMENTS FOR LITTER MONITORING IN HARBOR WATERS

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The same pattern is observed in leading industries distribution as well. All the said gives rise to a number of conflicts in the "man – environment" system, marine environment pollution with litter among them.

3

This problem is one of the most serious ones in APR countries' coastal zones

Marine Litter in Japan
(Mr. TANAKA presentation)

Marine Litter in Korea
(Mr. Jung presentation)

Marine Litter in China
(Dr. HU presentation)

Marine Litter in Russia

4

Various public and research organizations of the region are engaged in the study of coastal marine zone pollution and litter composition, actual and potential pollution sources are being revealed.

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However, there is no commonly accepted policy for coastal pollution evaluation yet, which causes wide-spread doubts as to the reliability of the data collected

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Litter on the sea surface may be caused both by the shore-based (carryover from beaches) and by the sea-based sources (trans-border carryover, transport industry)

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About 6.5 mln tons of litter are introduced into marine environment annually, a considerable portion being stable synthetic materials.

8

Recent years have witnessed regular large-scale operations in cleaning sea coasts from litter

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Litter management is governed by the regulatory and legal framework of the present day

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the Rules for Preventing Pollution by litter from Ships completely ban dumping of any type of plastics into the sea, including synthetic materials, but still considerable amounts of plastics show up in the marine environment

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The Primorsky Krai coastal zone is no exception

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With due regard to all the above the Sea Protection Institute, Maritime State University named after Admiral G.I. Nevelskoy conducts assessment of coastal zone pollution in the Peter the Great Gulf and development of marine litter monitoring techniques

13

No. of the point	Litter Monitoring Table (a fragment)				
	zone 1.1	zone 1.2	zone 1.3	zone 2	zone 3
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

At the First International Marine Litter Workshop there was a presentation of techniques based on the assessment of qualitative and quantitative composition of litter in various geomorphologic sections of the beach

14

...and of the results obtained from the coastal pollution study

15

The Workshop has demonstrated that despite the shared severity of the problem throughout NOWPAP region, the sources of pollutant introduction into the marine coastal environment of Japan, Korea, China, and Russia are quite different

Marine litter in Korea
(Mr. Hong Gun Sung presentation)

Marine litter in Japan
(Mr. Ohkura presentation)

16

In the south-western part of Primorsky Krai the "land originated" litter is prevailing

17

It is mainly coming from the enterprises and companies doing their business on the coast, as well as tourism, represented as a rule by unmanaged tourist camps

18

Litter of the sea origin is predominant in the southern part of the Khasan seashore. There wide sandy beaches are mostly polluted in the zones of max and medium setup, while litter is basically composed of the matter of overseas origin (e.g., consumer plastics)

19

Thus one can make conclusions as to the litter origin and ways of coming. These may be, for instance, currents bringing litter from the open sea, or the Tumannaya River stream and its further spread by the currents over the sea water area

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The analysis of the data obtained through the 1999 – 2005 research made it possible to arrive at the following conclusions:

21

1. it's the beach supralittoral zone which is the most heavily polluted part of the coastal zone

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2. the coast is the more polluted the closer it is to the developed lands

Developed beaches in the Khasan area

Unreclaimed beaches in the Khasan area

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3. near-estuary areas are subject to extensive pollution

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4. smalls predominate in the litter structure

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As to the arrangements for marine litter monitoring in offshore zones, the first ever overall attempt to conduct it will be undertaken in the Peter the Great Gulf waters during summer, 2006 with the support of the Floating Lab (Sea Protection Institute) aboard motor sailing yacht "Rif"

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The research in the course of the expedition is scheduled to be carried out by the Institute staff and students

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Monitoring is based on the method of offshore zone pollution assessment tested in 2005

Regular-shaped grid has been selected as an operational area unit of mapping, the cell frequency of which depends on the area of the zone under research.

South-west coast of Primorskiy region

29

The yacht design provides for a fine-meshed trawl net of 5m in breadth and 10m in length. The trawl net is thrown from the fore of the boat. Further course is shaped according to the predetermined grid supported by GPS fixes.

30

The quantity of litter of different size is calculated and the litter qualitative characteristics are recorded.

organic substance	garbage	
	wood	
non-organic substance	plastics	
	rubber	

31

As to the size there are three categories

small litter	objects up to 5cm in size	
middle litter	objects from 5cm to 50cm	
large litter	over 50cm	
Objects of more than 1m are beyond categories.		

32

The data is inserted into the table

A Fragment of Litter Monitoring in Offshore Zone Table

cell No.	travel time (hrs)	how propelled		Litter qualitative and quantitative characteristics (pcs)		
		motor-driven	wind-driven			
				consumer waste	small	
					medium	
					large	
				wood	small	
					medium	
					large	
				plastics	small	
					medium	
					large	
				fishing gear	small	
					medium	
					large	

33

Simultaneously photographic work and video filming take place making it possible to grasp a whole picture when conducting office operations. The expedition results achieved through monitoring are then recorded into the database.

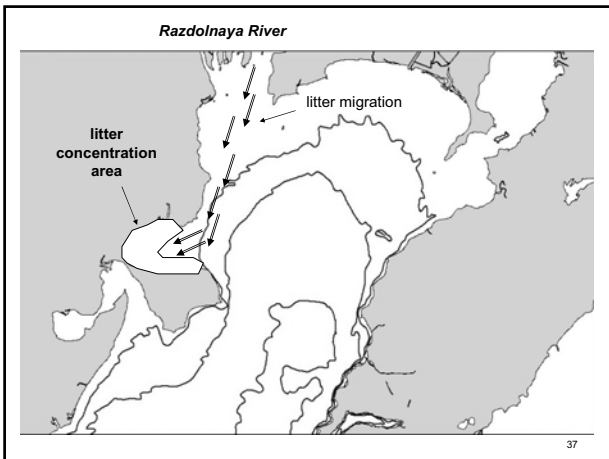
34

In order to obtain a more or less adequate picture of waters littering the measurements are conducted taking hydrodynamic parameters into account.

35

Wind amplitude characteristics allow determining the litter concentration zones

36



At a varying distance offshore litter's qualitative and quantitative characteristics will vary.

The block contains three photographs showing litter at different distances from the shore. The top right photo shows a log and a metal can on a rocky shore. The middle photo shows a plastic bottle on a rocky shore. The bottom left photo shows a dense collection of small pieces of litter on a rocky shore. The number 38 is in the bottom right corner.

For the purpose of identifying areas of increased litter concentration it is necessary to make use of the remote sensing data.

The block contains three satellite images showing litter concentration in water. The top left image shows a dark area in the water. The top right image shows a dark area in the water. The bottom image shows a dark area in the water. The number 39 is in the bottom right corner.

Therefore, when planning monitoring activities a stage of reconnaissance operations on the basis of modeling is essential. Modeling is based on the deployment of geoinformation systems.

The block contains a diagram of a geoinformation system and a screenshot of a GIS application. The diagram shows a flow from 'Data' to 'Modeling' and 'Analysis', leading to 'Information' and 'Decision Support'. The screenshot shows a map with various layers and a legend. The number 40 is in the bottom right corner.

The use of the Floating Lab, featuring a high degree of independence and performance while being comparatively inexpensive, seems to be the best way for monitoring not only in inner waters but in the offshore zones as well. Harbor services may be incorporated into the monitoring process in the inner waters.

The block contains a photograph of a Floating Lab vessel, a small boat with a canopy, on the water. The number 41 is in the bottom right corner.

All of the NOWPAP participating nations are involved into finding a solution to this problem to a varying degree, but all of them share the same idea: it is necessary not only to keep a check on litter within their own territories and waters, but to unite efforts with the neighbors in domains of management, technologies, and monitoring.

The block contains a photograph of a meeting or conference, showing several people sitting at a table. The number 42 is in the bottom right corner.

