NOWPAP POMRAC

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Pollution Monitoring Regional Activity Centre

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Report of 2nd Meeting of NOWPAP Working Group 1

- Atmospheric Deposition of Contaminants into the Marine and Coastal Environment

POMRAC, Vladivostok, Russian Federation

10-11 October 2005

UNEP/NOWPAP/POMRAC/WG1 2/7

Report of 2nd Meeting of NOWPAP Working Group 2

- River and Direct Inputs of Contaminants into the Marine and Coastal Environment

POMRAC, Vladivostok, Russian Federation

10-11 October 2005

UNEP/NOWPAP/POMRAC/WG2 2/7

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POMRAC, Vladivostok, Russian Federation

10 -11 October 2005

UNEP/NOWPAP/POMRAC/WG1 2/7

Report of the 2 nd Meeting of NOWPAP Working Group 1 Atmospheric Deposition of Contaminants into the Marine and Coastal Environment

(Vladivostok, Russian Federation, 10-11 October 2005)

Background

1. The Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP) and three Resolutions were adopted at the First Intergovernmental Meeting (Seoul, Republic of Korea, 14 September 1994: UNEP(OCA)/NOWPAP/IG.1/5). Resolution 1 identified five areas of priority for implementation of the Action Plan, one of which was NOWPAP/3: Establishment of a collaborative, regional monitoring programme.

2. Following the decision of the 3rd NOWPAP Intergovernmental Meeting, the responsibility for NOWPAP/3 (Regional Monitoring Programme) was jointly shared by the Special Monitoring and Coastal Environmental Assessment Regional Activity Center (CEARAC) and the Pollution Monitoring Regional Activity Center (POMRAC) to carry out regional activities.

3. Following the results of discussions at the First NOWPAP/3 Meeting (Beijing, China, 21-22 May 2001), the 7th NOWPAP Intergovernmental Meeting (Vladivostok, 20-22 March 2002) approved the resolution 3 Para.6, “the demarcation of the responsibilities and activities between CEARAC and POMRAC as presented by the secretariat in document UNEP/NOWPAP IG.7/8”. Subsequently POMRAC was allocated with the responsibility to implement activities related to Working Group (WG) 1 - Atmospheric Deposition and WG 2 - River and Direct Inputs.

4. The 1st Focal Points Meeting of POMRAC (Vladivostok, Russia, 9-11 April 2003) decided that the main task of WG 1 and WG 2 should be to establish regional assessment programs to evaluate the - i) atmospheric deposition of contaminants; and ii) river and direct inputs of contaminants into the marine and coastal environment in NOWPAP region, respectively.

5. The 1st Focal Points Meeting of POMRAC also decided that the main objectives of WG 1 and WG 2 (respectively) would be:

5.1. Exchange information to ensure practical implementation of activities related to the monitoring of atmospheric deposition / river and direct inputs in the NOWPAP region.

5.2. Promote, coordinate and harmonize regional cooperation in the NOWPAP region related to the monitoring of atmospheric deposition / river and direct inputs into the coastal and marine environment.

6. The 1st Joint Meeting of NOWPAP POMRAC Working Groups (WG 1 and WG 2) was organized by POMRAC on 24-25 May 2004 in Vladivostok, the Russian Federation. The Meeting reviewed Structures and Contents of National Reports of

NOWPAP Members for WG 1 and WG 2 and discussed the procedure of preparing the National Reports.

7. The 2nd Focal Points Meeting of POMRAC (Vladivostok, Russia, 26-27 May 2004) adopted the procedure for the compilation and preparation of National Reports for WG 1 and WG 2. It was adopted that the National Reports will be prepared by either the POMRAC Focal Points assisted by National Experts, or directly by National Experts hired by POMRAC. Financial support for the preparation of the National Reports will be provided by POMRAC, according to guidance of POMRAC FPs. It was decided that for unification of the data from NOWPAP Members samples of some tables and lists of recommended parameters will be submitted by POMRAC Secretariat after its approval by National Focal Points.

8. The 2nd Meeting of NOWPAP Working Group 1 has reviewed the National Reports, prepared by NOWPAP Members, provided recommendations on their harmonization and publishing, discussed and adopted Structure of the Regional Overview for WG 1, which should be adopted at the Third NOWPAP POMRAC Focal Points Meeting, discussed and adopted the establishment of the Reference Database for WG 1.

9. The representatives of NOWPAP Members, China, Japan, Korea and Russia participated in the Second Meeting of NOWPAP Working Group 1, which was organized by POMRAC and took place in Vladivostok, Russian Federation, 10-11 October 2005. The representative of NOWPAP RCU Toyama Office also participated in the meeting. The representatives of Special Monitoring & Costal Environmental Assessment Regional Activity Centre (CEARAC), participated in the meeting as observers. A full list of participants is **Annex 1** attached to the present report.

10 October 2005

Agenda Item 1: Opening of the Meeting

10. Dr. Anatoly KACHUR, Director of NOWPAP Pollution Monitoring Regional Activity Centre opened the 2nd Joint Meeting of NOWPAP POMRAC Working Groups: WG 1 and WG 2 at 9:15 am at the Conference Room of the Pacific Geographical Institute FEB RAS, Vladivostok, Russian Federation, on the 10th of October 2005. In his statement, he welcomed the WGs' participants to Vladivostok.

11. Dr. KACHUR Anatoly also noticed that considering the necessity of discussing planned questions for each WG separately, it was proposed to separate proceedings of the both WGs and, as a consequence, to prepare particular documents and to adopt particular Reports of the Working Group Meetings. The meeting of WG 1 (Atmospheric Deposition) took place at the Conference Room of the Pacific Geographical Institute FEB RAS**.**

Agenda Item 2: Organization of the Meeting WG1

12. According to the decision of the 1st Joint Meeting of NOWPAP POMRAC Working Groups: WG 1 and WG 2 on a rotational basis for the duty of the chairpersons for the

Working Groups, the participants have unanimously elected Mr. ZHANG Yutian, national expert of China, as the Chairperson, and Dr. CHOI Hee Gu, national expert of Republic of Korea, as the Rapporteur for the Second Meeting of Working Group 1 (Atmospheric Deposition).

13. The Meeting agreed to apply the rules of procedures for the Meeting as provided by the Governing Council of UNEP.

14. The Meeting was conducted in English.

Agenda Item 3: Adoption of the Agenda

15. The List of Documents (**Annex 2**), the Provisional Agenda (**Annex 3**), and the Timetable (**Annex 3.1**) have been adopted by participants.

Agenda Item 4: Overview of National Reports prepared by National Experts of WG1[1]

16. Dr. UEMATSU Mitsuo, national expert of Japan, has represented the outlines of the National Report of Japan on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in the NOWPAP Region.

17. Dr. ZHANG Yutian, national expert of the People's Republic of China has represented the National Report on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in the NOWPAP Region of China.

18. Dr. CHOI Hee Gu, national expert of Republic of Korea, has represented the National Report on Atmospheric Deposition in Korea.

19. Dr. MISHUKOV Vasily, national expert of the Russian Federation has represented the National Report of the Russian Federation on Atmospheric Deposition of Contaminants.

Agenda Item 5: Discussing recommendations on harmonization and publishing of National Reports of WG1

20. Dr. KACHUR, Director of POMRAC, presented a brief technical analysis of the National Reports for WG1 in accordance to the structure adopted at the 2nd FPM. The results and some recommendations on completion of the reports have been summarized by POMRAC Secretariat into Table 1 of the Report of NOWPAP WG1 (AD) Intercessional Activity (UNEP/NOWPAP/POMRAC/WG1 2/3) (**Annex 4**).

21. After discussion of the presented results and recommendations chapter by chapter, the meeting decided that the procedure for the completion, harmonization and publishing of the National Reports would be as follows:

[1] The summaries of presentations on National Reports are attached to this report as Appendixes.

21.1. Although the compilers of the National Reports for the WG1 followed the proposed format and structure in main, however there are several digressions and missed data. Nevertheless, before publishing the National Reports should be harmonized and brought to uniform appearance of all 4 national reports, including tables, annexes, and so on.

21.2. Mr. ZHANG proposed that it would be better to supplement the National Reports with description of monitoring stations networks and management systems of various level (state, provincial, municipal) in NOWPAP Region.

21.3. The deadline for supplementation of missed data to include in the national reports for WG1 is November 10, 2005, because the budget for their printing is allocated for 2005, and POMRAC Secretariat requires at least one month additionally to prepare the national reports for printing. According to the experience of CEARAC, additional time can be required to get official approval of the National Reports.

21.4. The National Reports of the WG1 (AD) will be printed by POMRAC Secretariat as one technical report book after getting official approvals from each NOWPAP country.

Agenda Item 6: Discussion of the Structure of the Regional Overview for WG 1

22. Dr. KACHUR, Director of POMRAC, presented a draft of the Structure of the Regional Overview for the meeting as it was agreed in the course of the 2nd FPM (**Annex 5**).

23. The Regional Overview is proposed to be prepared using primarily the data from the National Reports for the WG1 coupled with attraction of data from other regional and international sources. In this respect it is very important to find appropriate consultant to fulfill this work. The meeting discussed possible candidates and finally decided to entrust POMRAC Secretariat with hiring a consultant to prepare the Regional Overview.

24. The meeting agreed that the deadline to start preparation of the Regional Overview should be by November 2005 so to submit the draft to the 3rd WG1 in April, 2006.

11 October 2005

Agenda Item 7: Discussion of the establishment of the Reference Database on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region (AD Reference Database)

25. Dr. KACHUR represented the structure and samples for the AD Reference Database to the meeting participants (**Annex 6**). In January next year it is supposed to contract national experts nominated by NFPs and over the following 3 months (February-April) the national experts will be asked to provide references to POMRAC

Secretariat so could develop the first draft of the AD Reference Database to submit it to the next WG1 meeting.

26. After discussion, the meeting came to joint agreement that the procedures to establish the AD Reference Database would be as follows:

26.1. The Reference Database should be developed in cooperation with DINRAC and other sources including EANET.

26.2. It is advisable to collect the references beginning from the 1980s.

26.3. The reference database is proposed to include mainly scientific articles and papers from official sources primarily, and then, secondarily, from other sources.

26.4. After its establishing, the Reference Database should be updated regularly.

Agenda Item 8: Discussion of the WG 1 workplan for the end of 2005 and 2006-2007

27. Dr. KACHUR presented to the Meeting a Draft Workplan of the WG1 for the end of 2005 and 2006-2007. After discussion the Meeting adopted the Workplan (**Annex 7**).

28. Two remaining months of 2005 will be used for consultations on format of the reference database.

29. According to the consultations with RCU, it was agreed to hold the WG1 and WG2 jointly in the second half of April, 2006.

30. The Meeting has not reached any decision on activities for 2007 and on holding the 4th WG in 2007, because it depends on selection of new direction of RACs' activities by the next IGM Meeting (UNEP/NOWPAP/POMRAC/WG1 2/6).

31. The main topics to be covered in the course of the 3rd WG1 (AD) Meeting would be as follows:

- to review Regional Overview for WG 1;
- to review the establishment of AD Reference Database
- to review plans for future work

Agenda Item 9: Arrangement of date and venue of the Third Meeting of NOWPAP POMRAC Working Group 1 (AD)

32. It was proposed to hold the next 3th WG1 (AD) Meeting jointly with the 3rd WG2 (RDI) Meeting in China in April-May, 2006. Mr. WANG Ruibin noted that it would require a permission of SEPA.

Agenda Item 10: Other Matters

33. No other issues have been raised by the participants of the WG1.

Agenda Item 11: Adoption of the report of the meeting

34. The Meeting reviewed the report prepared by the Rapporteur and the Secretariat, and approved it for distribution after some corrections and finalizing by the Secretariat.

Agenda Item 12: Closure of the Meeting

35. The meeting has been closed by the chairperson at 19:00 on Tuesday, October 11, 2005.

Participants of the 2nd Meeting of NOWPAP Working Group 1
(Vladivostok, Russian Federation, 10-11 October, 2005)

Annex

Annex content

Annex 1

List of participants
of the 2nd Meeting of NOWPAP Working Group 1

Annex 1

List of participants of the 2nd Meeting of NOWPAP Working Group 1

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Annex 2

List of Documents
for the 2nd Meeting of NOWPAP Working Group 1

Annex 2

List of Documents for the 2nd Meeting of NOWPAP Working Group 1

Timetable Provisional Agenda	UNEP/NOWPAP/POMRAC/WG 1 2/1
Annotated Provisional Agenda	UNEP/NOWPAP/POMRAC/WG 1 2/2
Report of NOWPAP WG 1 (Atmospheric Deposition) Intercessional Activity	UNEP/NOWPAP/POMRAC/WG 1 2/3
DRAFT Structure and Content of Regional Overview on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region	UNEP/NOWPAP/POMRAC/WG 1 2/4
DRAFT Reference Database on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region (AD Reference Database)	UNEP/NOWPAP/POMRAC/WG 1 2/5
DRAFT Working Group 1 Workplan for the end of 2005 and 2006/2007	UNEP/NOWPAP/POMRAC/WG 1 2/6
Provisional list of participants	UNEP/NOWPAP/POMRAC/WG 1 2/Inf. 1

NATIONAL REPORTS

National Report of Japan on Atmospheric Deposition of Contaminants Into the Marine and Coastal Environment in the NOWPAP Region

National Report on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region of China

National Report on Atmospheric Deposition in Korea

National Report of the Russian Federation on Atmospheric Deposition of Contaminants

Annex 3

Provisional Agenda

Annex 3

Provisional Agenda

Day 1 (October 10, 2005)

1. Opening of the meeting (together with WG2)
2. Organization of the meeting
   Election of the officers
   Organization of work
3. Adoption of the Agenda
4. Overview of National Reports, prepared by National Experts of WG 1
   4.1. Report of the Japanese National Expert
   4.2. Report of the Chinese National Expert
   4.3. Report of the Korean National Expert
   4.4. Report of the Russian National Expert
5. Discussion of recommendations for harmonization and publishing of National Reports of WG1
6. Discussion of the Structure of the Regional Assessment/Overview for WG 1

Day 2 (October 11, 2005)

7. Discussion of the establishment of the Reference Database on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region (AD Reference Database)
8. Discussion of the WG 1 workplan for 2006
9. Arrangement date and venue of the Third Meeting of NOWPAP POMRAC Working Group 1 (AD)
10. Other matters
11. Adoption of the report of the meeting
12. Closure of the meeting

Annex 3.1

Timetable

Annex 3.1

Timetable

Day 1 (10 October 2005)

9:00 – 9:15 Registration

9:15 – 9:30 Agenda Item 1. Opening of the Meeting

9:30 – 9:40 Agenda Item 2. Organization of the Meeting

9:40 – 9:50 Agenda Item 3. Adoption of the Agenda

9:50 – 12:20 Agenda Item 4. Overview of National Reports, prepared by National Experts of WG1

9:50 – 10:20 4.1. Report of the Japanese National Expert

10:20 – 10:50 4.2. Report of the Chinese National Expert

10:50 – 11:20 (Coffee Break) (Group Photograph)

11:20 – 11:50 4.3. Report of the Korean National Expert

11:50 – 12:20 4.4. Report of the Russian National Expert

12:20 – 14:00 Lunch Break

14:00 – 15:30 Agenda Item 5. Discussion of recommendations for harmonization and publishing of National Reports of WG1

15:30 – 17:00 Agenda Item 6. Discussion of the Structure of the Regional Assessment/Overview for WG 1

Day 2 (11 October 2005)

9:00 – 10:20 Agenda Item 7. Discussion of the establishment of the Reference Database on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region (AD Reference Database)

10:20 – 10:40 (Coffee Break)

10:40 – 12:00 Agenda Item 8. Discussion of the WG 1 workplan for 2006

12:00 – 12:20 Agenda Item 9. Arrangement date and venue of the Third Meeting of NOWPAP POMRAC Working Group 1 (AD)

12:20 – 12:30 Agenda Item 10. Other Matters

12:30 – 16:00 Lunch Break
Preparation of the meeting report by the Secretariat

16:00 – 17:30 Agenda Item 11. Adoption of the report of the meeting

17:30 Agenda Item 12. Closure of the Meeting

Annex 4

Report of NOWPAP WG 1 (Atmospheric Deposition) Intercessional Activity

Annex 4

Report of NOWPAP WG1 (Atmospheric Deposition) Intercessional Activity

According to Terms of Reference for WG 1, adopted by the 2nd NOWPAP POMRAC FPM (26-27 May, 2004) the main objectives of WG 1 are:

(a) Exchange information to ensure practical implementation of activities related to the monitoring of Atmospheric Deposition in the NOWPAP region.
(b) Promote, coordinate and harmonize regional cooperation in the NOWPAP region related to the monitoring of Atmospheric Deposition of contaminants into the coastal and marine environment.

According to the workplan for POMRAC in 2004/2005 (UNEP/NOWPAP/POMRAC/FPM 2/7) the preparation of the National Reports of WG 1 was the main activity during the intercessional period.

Fulfilling the activity included the following:
1. Development of Structure of the National Reports
2. Development of Sample Tables for the National Reports
3. Signing contracts with National Experts, appointed by Focal Points
4. Technical testing of conformity of the Reports with the established structure

Detailed description of the stages is given below.

1. Development of Structure of National Reports

The Structure of National Reports was discussed and approved in the 2nd NOWPAP POMRAC FPM ((UNEP/NOWPAP/POMRAC/FPM 2/7, Annex 7).

2. Development of Sample Tables for the National Reports

Sample Tables for the National Reports were prepared by POMRAC Secretariat in July 2004 and distributed among POMRAC Focal Points for harmonization. The tables are given below.

Table 2.1.* Geographical characteristics of the main territorial objects (river basins, provinces or regions)

Territorial object (river basin, province or region)	Square, km^2	GDP** per capita, USD/person
Object 1		
Object 2		
…		
Total		

*Number of the table corresponds to the number of chapter of the report.
** GDP – Gross domestic product

Table 4.1.1. Number of stations for different kinds of monitoring

Kind of monitoring	Number of stations
Air pollution	
Chemical composition of precipitation	
Pollution of snow cover	
Acidity of precipitation	
Acid rain (EANET*)	

*EANET = Acid Deposition Monitoring Network in East Asia

Table 4.1.2. Frequency of observations at different monitoring stations

Kind of monitoring	Frequency
Air pollution	
Precipitation composition	
Snow cover composition	
Precipitation acidity	
EANET, dry deposition	
EANET, wet deposition	

Table 4.2.1. Monitoring parameters and analytical methods used (air pollution measurements)

Parameter	Method	Measurement range	Accuracy
Suspended solids (SS or dust)			
CO			
NH_3			
NO			
NO_2			
SO_2			
H_2S			
Formaldehyde			
SO_4			
Co, Cr, Cu, Fe, Mn, Ni, Zn			
Cd			
Pb			
Benz(a)pyrene			
…			
other substances			

Table 4.2.2. Monitoring parameters and analytical methods used (precipitation and snow cover composition)

Parameter	Method	Measurement range	Accuracy
NH_4			
NO_3			
Na, K			
Ca, Mg, Zn			
pH			
Conductivity			
SO_4			
Cl			
HCO_3			
…			
other substances			

Table 4.2.3. Monitoring parameters and analytical methods used for acid deposition monitoring (EANET)

Parameters	Methods
Wet deposition (the same parameters as precipitation)	
Dry deposition	

Table 5.1. Contents of some pollutants in the air of major cities (average for 2002)

Pollutants	Cities						
	… (City 1)	… (City 2)	… (City 3)	… (City 4)	… (City 5)	…	MPC*
				mg/m^3			
Dust							
NO_2							
SO_2							
H_2S							
B(a)P							
CO							
…							
other substances							
				$\mu g/m^3$			
Pb							
Cu							
Zn							
Fe							
Mn							
Cd							
Al							
…							
other substances							

*MPC = maximum permissible concentrations, B(a)P = benz(a)pyrene

Table 5.2. Chemical composition of precipitation for territorial objects (cities, river basins, provinces or regions) (month-averaged for 2002)

Month	Precipita-tion (mm)	pH	Cl^- mg/m^3	Na^+ mg/m^3	K^+ mg/m^3	Ca^{2+} mg/m^3	Mg^{2+} mg/m^3	…	*other substances*	*other substances*
… (Territorial object 1)										
January										
February										
March										
April										
May										
June										
July										
August										
September										
October										
November										
December										
… (Territorial object 2)										
January										
…										
December										
…										
January										
…										
December										

Table 5.3. Atmospheric deposition of macro elements for territorial objects (cities, river basins, provinces or regions) in 2002

Deposition, g/m^2												
Month	**SO_4^{2-}**	**NO_3^-**	**NH_4^+**	**Ca**	**K**	**Mg**	**Cl**	**Na**	**HCO_3**	**…**	*other substances*	*other substances*
… (Territorial object 1)												
January												
February												
March												
April												
May												
June												
July												
August												
September												
October												
November												
December												
Year												
… (Territorial object 2)												
January												
…												
December												
Year												
…												
January												
…												
December												
Year												

Table 5.4. Atmospheric deposition of trace metals for territorial objects (cities, river basins, provinces or regions) in 2002

Deposition, g/m^2										
Month	**Pb$^-$**	**Cu**	**Zn**	**Fe**	**Mn**	**Cd**	**Al**	*…*	*other substances*	*other substances*
… (Territorial object 1)										
January										
February										
Murch										
April										
May										
June										
July										
August										
September										
October										
November										
December										
Year										
… (Territorial object 2)										
January										
…										
December										
Year										
…										
January										
…										
December										
Year										

Table 5.5. Atmospheric deposition of organic pollutants for territorial objects (cities, river basins, provinces or regions) in 2002

Deposition, g/m^2						
Month	**PAH**	**PCBs**	**DDT**	*…*	*other substances*	*other substances*
… (Territorial object 1)						
January						
February						
Murch						
April						
May						
June						
July						
August						
September						
October						
November						
December						
Year						
… (Territorial object 2)						
January						
…						
December						
Year						
…						
January						
…						
December						
Year						

3. Signing contracts with National Experts, appointed by Focal Points

In July-August 2004 POMRAC Secretariat prepared the blank of *Memorandum of Understanding*

for preparation of National Report by the National Experts and *Terms of Reference for preparation of National Report*. Owing to peculiarities of Russian banking system, transfer of money to Experts' accounts for report preparation was impossible from Russia. In the beginning of 2005, NOWPAP RCU Office supported the POMRAC proposal referring to the transfer of money to the Experts immediately by RCU. Memorandums of Understanding for preparation of National Reports were signed by the National Experts in March-May 2005. In July-September 2005 National Experts sent National Reports to POMRAC Secretariat.

List of the National Experts who prepared the National Reports is given below.

List of the National Experts

Mr. Masanobu MIYAZAKI
Director CEARAC
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E-mail: vmishukov@poi.dvo.ru

4. Technical testing of conformity of the Reports with the established structure

POMRAC Secretariat has conducted the technical testing of conformity of the National Reports in accordance with the established structure. The results are given in the table 1.

Analysis of report composition conformity with the structure established by the 2nd NOWPAP POMRAC FPM (UNEP/NOWPAP/POMRAC/ FPM 2/7, Annex 7) has indicated that the compilers followed the structure in bulk. But there are several deviations from the established structure. The Secretariat commentaries relating presented National Reports are in Notes to table 1.

Table 1

Analysis correspondence of the National Reports by WG 1 (Atmospheric Deposition), with the structure established by the 2nd NOWPAP POMRAC FPM

Structure and Content of National Reports of NOWPAP Members on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region (as adopted at the 2nd NOWPAP POMRAC FPM)	**Japan**	**China**	**Korea**	**Russia**
1. Executive Summary	0.7 page	0.7 page	1 page	0.7 page
2. Introduction	7.2 pages	8 pages	2 pages	1.5 pages
▪ Goals and objectives of this report	+	+	+	+
▪ General background information on NOWPAP (set the report in the context of NOWPAP, short history, decisions)	+	+	+	+
▪ General information/introduction on atmospheric deposition of contaminants (what is it, why is it important, relevance to the region etc.)	+	+	+	- (NO DATA)[1]
▪ Geographical scope (geographical coverage of the repor t, characteristics of the country and it's environment relat ed to the issue. e.g. major rivers, coasts, mountains, citie s, climatic systems, physical geography etc.)	+	+	- (NO DATA)[2]	+
Table 2.1. Geographical characteristics of the main territorial objects (river basins, provinces or regions)	+	+	- (NO DATA)[3]	- (NO DATA)[4]
▪ Institutional arrangements for developing these reports (who prepared this report)	+	+	- (NO DATA)[5]	+
3. Social and economic situation (short overview of relevant social and economic aspects related to atmospheric deposition, e.g. population, distribution of communities in the country	7 pages[6]	1.5 pages[7]	6 pages	2 pages [8]

[1] No data. It is advisable to add to the information.
[2] No data. It is advisable to add to the information.
[3] No data. It is advisable to add to the information.
[4] No data. It is advisable to add to the information.
[5] No data. It is advisable to add to the information.

Structure and Content of National Reports of NOWPAP Members on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region (as adopted at the 2nd NOWPAP POMRAC FPM)	**Japan**	**China**	**Korea**	**Russia**
(mainly coastal or inland communities), main income, anthropogenic activities which cause atmospheric deposition, transport, energy, industry)				
4. National monitoring and research activities related to atmospheric deposition of contaminants	18 pages	8 pages	15 pages	10 pages
4.1 National programmes (major scientific or administrative programmes, actors/organizations etc., institutional framework, regular or irregular activities/projects, number and location of stations, existing monitoring parameters (chemical, physical and others) and frequency, etc., including tables and maps).	+	+	+	+
Table 4.1.1. Number of stations for different kinds of monitoring	+	+	+	+
Table 4.1.2. Frequency of observations at different monitoring stations	+	+	- (NO DATA)[9]	+
4.2 Methodologies/procedures (including equipment used, detection limits and accuracy – preferably in tabular form [sample tables to be provided by POMRAC Secretariat], QA/QC procedures applicable to atmospheric deposition used in each NOWPAP country).	+	+	+	+
Table 4.2.1. Monitoring parameters and analytical methods used (air pollution measurements)	+	+	+	+
Table 4.2.2. Monitoring parameters and analytical methods used (precipitation and snow cover composition)	+	+	+	+
Table 4.2.3. Monitoring parameters and analytical methods	+[10]	+	+	+

[6] No data on motor transport and power plants. It is advisable to add to the information.
[7] No data on motor transport. It is advisable to add to the information.
[8] No data on motor transport and power plants. It is advisable to add to the information.
[9] No data. It is advisable to add to the information.

Structure and Content of National Reports of NOWPAP Members on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region (as adopted at the 2nd NOWPAP POMRAC FPM)	**Japan**	**China**	**Korea**	**Russia**
used for acid deposition monitoring (EANET)				
4.3 Research activities (related to atmospheric deposition in NOWPAP region).	+	+	+	+
4.4 Training activities (related to atmospheric deposition)	+	+	+	+
5. Present situation of atmospheric deposition of contaminants (based on 2002 data) and long term trends, if available.	14 pages	3.5 pages	0.5 page	5 pages
Table 5.1. Contents of some pollutants in the air of major cities (average for 2002)	+[11]			
Table 5.2. Chemical composition of precipitation for territorial objects (cities, river basins, provinces or regions) (month-averaged for 2002)	+	+[12]	- (NO DATA)[13]	+ (in tables 5.2-5.3)
Table 5.3. Atmospheric deposition of macro elements for territorial objects (cities, river basins, provinces) in 2002	+	- (NO DATA)[14]	- (NO DATA)[15]	+ (in tabl. 5.4-5.5)
Table 5.4. Atmospheric deposition of trace metals for territorial objects (cities, river basins, provinces or regions) in 2002	- (NO DATA)[16]			
Table 5.5. Atmospheric deposition of organic pollutants for territorial objects (cities, river basins, provinces or regions) in 2002	- (NO DATA)[17]			

[10] Tables 4.8-4.9 display information on all the parameters required except Zn^{2+} and HCO_3 for wet deposition and metals for dry deposition. It is advisable to add to the information.
[11] Not one of the National Reports contains all the recommended parameters. It is advisable to add to the data.
[12] Table 6.4 displays annual average data for different parameters. Monthly average data are absent. It is advisable to add to the data.
[13] No data. It is advisable to add to the information.
[14] No data. It is advisable to add to the information.
[15] No data. It is advisable to add to the information.
[16] No report presents the data. It is advisable to exclude the table from the list of recommended tables.

Structure and Content of National Reports of NOWPAP Members on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region (as adopted at the 2nd NOWPAP POMRAC FPM)	**Japan**	**China**	**Korea**	**Russia**
6. Recommendations for future regional activities and priorities (related to atmospheric deposition in NOWPAP region)	0.5 page	1 page	0,5 page	0.5 page
7. Conclusions	1 page	0,3 page	0,5 page	1 page
8. References (related publications, websites and other information sources available related to Atmospheric Deposition	0.5 page	0,5 page	1 page	1 page
Annex (s): **National Laws and Regulations** (overview of relevant policies and laws related to the subject).	2 pages	1 page[18]	3.5 pages	2 pages

[17] No report presents the data. It is advisable to exclude the table from the list of recommended tables.
[18] Data on National Laws and Regulations is documented in chapter 4. The Annex contains the table “Ambient Air Quality Standard of China GB3095-1996”.

Annex 5

Structure and Content of Regional Overview on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region

Annex 5

Structure and Content of Regional Overview on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region

1. Executive Summary

2. Introduction

- Goals and objectives of the Overview
- General background information on NOWPAP (set the Overview in the context of NOWPAP, short history, decisions)
- General information/introduction on atmospheric deposition of contaminants (what is it, why is it important, relevance to the region etc.)
- Geographical scope of NOWPAP area (geographical coverage of the report, major rivers, coasts, mountains, cities, climatic systems, physical geography etc.)
- Sources for developing these reports

3. Social and economic situation in 2002 (short overview of relevant social and economic aspects related to atmospheric deposition, e.g. population, distribution of communities in the country (mainly coastal or inland communities), main income, anthropogenic activities which cause atmospheric deposition, transport, energy, industry)

4. National and International monitoring and research activities related to atmospheric deposition of contaminants

4.1 Regional and International programmes (major scientific or administrative programmes, actors/organizations etc., institutional framework, regular or irregular activities/projects, number and location of stations, existing monitoring parameters (chemical, physical and others) and frequency, etc., including tables and maps).

4.2 Methodologies/procedures (including equipment used, detection limits and accuracy – preferably in tabular form [sample tables to be provided by POMRAC Secretariat], QA/QC procedures applicable to atmospheric deposition used in each NOWPAP country).

4.3 Research activities (national and international) (related to atmospheric deposition in NOWPAP region).

4.4 Training activities (related to atmospheric deposition)

5. Present situation of atmospheric deposition of contaminants (based on 2002 data) and long term trends, if available.

6. Recommendations for future regional activities and priorities (related to atmospheric deposition in NOWPAP region)

7. Conclusions

8. References (related publications, websites and other information sources available related to Atmospheric Deposition

Annex (s):

1. **National and International Laws and Regulations** (overview of relevant policies and laws related to the subject).

Procedure for the compilation and preparation of the Regional Overview on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region

The procedure includes the following stages:

1. The Regional Overview will be compiled on the basis of "Structure and Contents of Regional Overview" agreed upon by the 3rd NOWPAP POMRAC Focal Points Meeting. Different sources, and first of all National Reports of WG 1, may be used for compilation of the Regional Overview.

2. The Regional Overview will be prepared by consultant from any NOWPAP Member Countries. Financial support for the preparation of the Regional Overview will be provided by POMRAC, according to guidance of POMRAC FPs.

3. Draft Regional Overview will be submitted to POMRAC Secretariat by the consultant. POMRAC Secretariat will submit Draft Regional Overview to the WG1 and POMRAC Focal Points by e-mail. After receiving comments from WG1 and POMRAC FPs (within 30 days), the overview will be amended by the consultant and submitted to the next POMRAC FPM for review and adoption.

4. The next POMRAC FPM will discuss and agree whether the Regional Overview is completed. When finalized, the Regional Overview will be printed as a POMRAC technical report.

Annex 6

Reference Database on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region (AD Reference Database)

Annex 6

Reference Database on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region (AD Reference Database)

Background

According to the Terms of Reference for WG 1, adopted by the 2nd NOWPAP POMRAC FPM (26-27 May, 2004) the main objectives of WG 2 are:

(c) To exchange information to ensure practical implementation of activities related to the monitoring of Atmospheric Deposition in the NOWPAP region.
(d) To promote, coordinate and harmonize regional cooperation in the NOWPAP region related to the monitoring of Atmospheric Deposition of contaminants into the coastal and marine environment.

AD Reference Database is established in accordance with POMRAC Secretariat proposal and approved at the Second Meeting of NOWPAP Working Group 2 for improving information exchange related to the monitoring of atmospheric deposition of contaminants into the marine and coastal environment in NOWPAP region. It will comprise data on articles, scientific reports and databases concerning results of investigating current state of air pollution in NOWPAP region, monitoring methods of air quality and management of the environment. Thus, the database will improve coordination and harmonization of regional cooperation in monitoring of atmospheric deposition of contaminants into the marine and coastal environment in NOWPAP region.

Foundation of the AD Reference Database project

POMRAC and DINRAC are supposed to collaborate in AD Reference Database foundation. The basic function of Data and Information Network Regional Activity Center (DINRAC) is "… exchange information on marine and coastal environmental data and information management in the NOWPAP region…" (UNEP/NOWPAP/DINRAC/FPM 2/15, Annex 6). In the end of 2005, POMRAC Secretariat will offer DINRAC to collaborate in AD Reference Database foundation. In case of agreement, the duties will be allotted as follows: POMRAC will provide for obtaining reference data and present the data to DINRAC; DINRAC, in consequence, will develop electronic database for its hosting in Internet. The database will be available through both POMRAC and DINRAC web-sites.

In case of DINRAC impossibility to participate in the project, POMRAC will discuss other variants for its realization.

To realize the project, POMRAC Secretariat suggests approving supplementary budget for **Establishment of AD Reference Database** of US$ 2000, each National Expert of the four countries to be remunerated with US$ 500.

Filling AD Reference Database

1. AD Reference Database filling will be conducted by National Experts nominated by POMRAC Focal Points. Financial support for AD Reference Database filling will be provided by POMRAC, according to guidance of POMRAC FPs.

2. National Experts will provide data for AD Reference Database (not less than 100 references) considering following recommendations:

   - Each reference should be categorized into the following items:
     a) National Monitoring Systems and Methods of monitoring
     b) Air pollution in NOWPAP Region
     c) Atmospheric deposition of contaminants

   - Each reference should contain the following:
     a) Author(s)
     b) Name of publication
     c) Journal/monograph
     d) Year of publishing
     e) Language of the publication

For example:

Country: Russia

Category: ***National Monitoring Systems and Methods of monitoring***

1. Michoukov V., Uematsu M., Medvedev A. Some results of aerosol study in Russian East regions. *In: Proceedings of International Marine Science Symposium on Biogeochemical Processes in the North Pacific, Mutsu, Japan, November 12- 14, 1996.* Tokyo, Japan Marine Science Foundation. 1997. P. 392-413. *(In English)*

2. …

Category: ***Air pollution in NOWPAP Region***

1. Svinukhov G.V., Svinukhov V.G., Kondratiev I.I. Investigation and Short-term Forecasting of Air Pollution in Primorsky Kray Cities. Vladivostok, Far East State University, 1993. 96 pp. *(In Russian)*

2. …

Annex 7

Working Group 1 Workplan for the end of 2005 and 2006-2007

Annex 7

Working Group 1 Workplan for the end of 2005 and 2006-2007

Activity	2005			2006												2007											
	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1. Harmonization and printing of the National Reports	√	√	√	√																							
a) Finalization of the National Reports by experts who compiled them following the 3rd POMRAC FPM recommendations	√																										
b) Signing contracts with consultants approved by the 3rd POMRAC FPM to harmonize the National Reports	√																										
c) Presenting finalized National Reports by consultants and approving the Reports by the National Focal Points		√																									
d) Printing of National Reports			√	√																							
2. Preparation of the Regional Overview		√	√	√	√	√	√	√	√	√	√	√	√	√	√												
a) Signing contracts with consultants		√																									
b) Draft Regional Overview presentation by the							√																				

Activity	2005			2006												2007											
	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
appointed consultants																											
c) POMRAC Secretariat will submit Draft Regional Overview to RACs, experts and POMRAC Focal Points WG1by e-mail. After receiving comments from WG1 and POMRAC FPs (within 2 weeks), the overview will be revised by the consultant							√	√	√																		
d) Discussion of the Regional Overview on the 4th FPM												√															
e) Finalization of the Regional Overview by the consultant considering recommendations by the 4th FPM													√														
g) Printing of the Regional Overview														√	√												
3. Establishment of AD Reference Database		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
a) Offering cooperation to DINRAC and others organizations and programs		√																									
b) Preparation of format		√	√																								

Activity	2005			2006												2007											
	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
DB and nomination of national consultations (by FP)																											
c Signing contracts with National Experts (MOU, TOR, Formats).				√																							
d) Development of AD Reference Database					√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
e) Presentation of draft DB of Reference							√																				
f) Discussion further development of AD Reference Database on the Third Meeting of NOWPAP WG 1 and the 4th NOWPAP POMRAC FPM							√					√															
4. The Third Meeting of NOWPAP WG 1							√																				
5. The 4th NOWPAP POMRAC FPM												√															
6. The Fourth Meeting of NOWPAP WG 1							√												√								
7. The 5th NOWPAP POMRAC FPM																								√			
8. Other Activities *																											

Notes: * The detailed program of this activity will be discussed on the 3rd Joint WG,s Meeting(2006) after decision of the 10th Intergovernmental Meeting (November, 2005, Toyama, Japan) on change of NOWPAP RACs activity and will adopt on 4th POMRAC FPM.

Appendix

Appendix contents

Appendix I

National Report of Japan on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region By National Expert of Japan

Outline of National Report of Japan

WG1 POMRAC

On Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in the NOWPAP Region

10 October 2005

Vladivostok RUSSIA

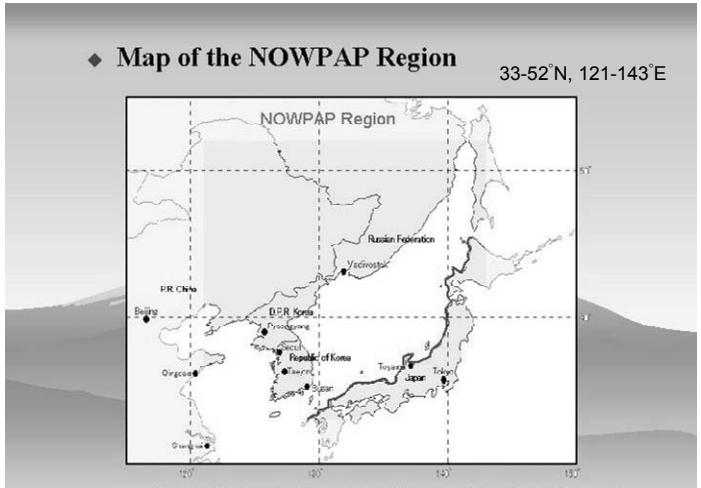
Table of Contents

1. Introduction

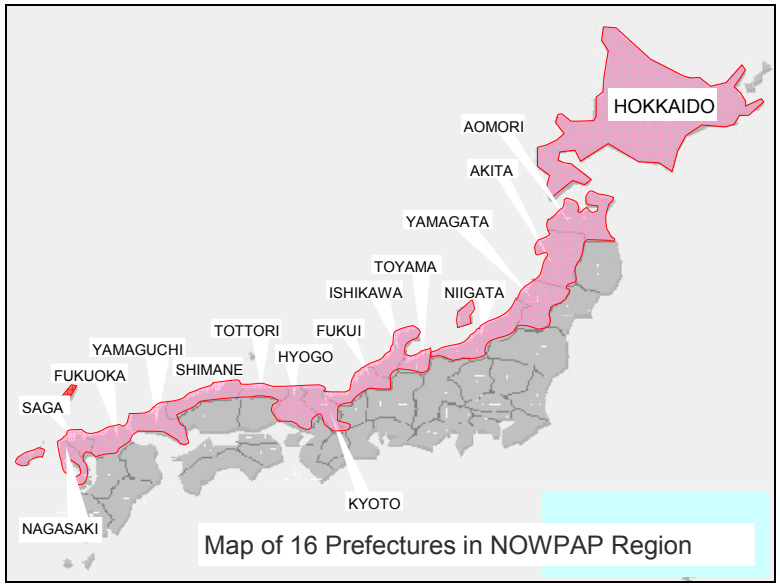
- **Purpose of the Report**

  This report introduces the national programs for Evaluation of Atmospheric Deposition of contaminants into the marine and coastal environment of the NOWPAP region, prepared by POMRAC WG1, Japan.

- **Map of the NOWPAP Region** 33-52°N, 121-143°E



Note: The red line shows the coastal zone of Japan



Map of 16 Prefectures in NOWPAP Region

◆ Geographical Outline of the NOWPAP Region

Total Area 182,841km^2

Residential area	5,126	(3%)
Rice field	12,781	(7%)
Farm land	12,558	(7%)
Forest and others	152,376	(83%)

◆ Outline of Climate

City	Tempera-ture(°C)	Moisture (%)	Wind direction (upwind)	Wind velocity (m/s)	Precipitation (mm)	Snow cover (cm)
Otaru	8.4	72	SW	2.6	1218	118
Akita	11.4	73	SE	4.4	1713	41
Niigata	13.5	73	S	3.5	1776	39
Toyama	13.7	77	SW	2.9	2245	69
Maizuru	14.3	77	WSW	2.2	1786	37
Matsue	14.6	77	W	3.3	1799	24
Oki	14.0	76	NW	3.4	1750	28
Fukuoka	16.6	69	SE	2.9	1632	3
Tsushima	15.5	71	NNW	3.0	2133	0

◆ The wind directions (upwind) in each season

Meteorological Station	Spring	Summer	Autumn	Winter
Otaru	SW	ENE	SW	WSW
Akita	SE	SE	SE	SE
Niigata	WSW	NNE	S	WNW
Toyama	SW	NNE	SW	SW
Maizuru	NNE	WSW	WSW	WSW
Matsue	W	W	E	W
Oki	NW	WSW	NW	NW
Fukuoka	N	N	N	SE
Tsushima	NNW	NNW	NNW	NNW

2. Social and Economic Situation in Recent Years

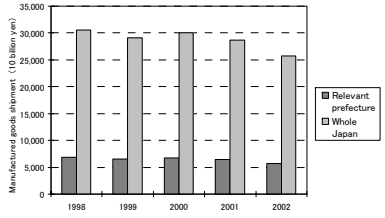
Population in the NOWPAP Region

Prefecture	1990	1995	2000	2002	Ratio to the Whole Country in 2002 (%)
■ Whole JAPAN	123,611	125,570	126,926	127,435	100
■ NOWPAP Region					
■ Total	34,019	34,248	34,405	34,383	26.98
Hokkaido	5,644	5,692	5,683	5,670	4.45
Aomori	1,483	1,482	1,476	1,469	1.15
Akita	1,227	1,214	1,189	1,176	0.92
Yamagata	1,258	1,257	1,244	1,235	0.97
Niigata	2,475	2,488	2,476	2,465	1.93
Toyama	1,120	1,123	1,121	1,119	0.88
Ishikawa	1,165	1,180	1,181	1,180	0.93
Fukui	824	827	829	828	0.65
Kyoto	2,602	2,630	2,644	2,642	2.07
Hyogo	5,405	5,402	5,551	5,578	4.38
Tottori	616	615	613	612	0.48
Shimane	781	771	762	757	0.59
Yamaguchi	1,573	1,556	1,528	1,518	1.19
Fukuoka	4,811	4,933	5,016	5,043	3.96
Saga	878	884	877	874	0.69
Nagasaki	1,536	1,545	1,517	1,507	1.18

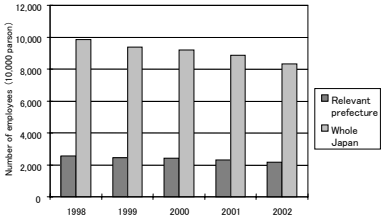
General Industrial Conditions

	Number of Employed People (unit:1000people)		Ratio to the Whole Country in 2001(%)	
The Whole Country	1991	60,019		
	1996	62,781		
	2001	60,158	100	
NOWPAP Region	2001	16,623	27.6	
	Hokkaido	2,585	4.3*	Including other area of NOWPAP region
	Aomori	633	1.1	
	Akita	523	0.9	
	Yamagata	570	1.0	
	Niigata	1,178	2.0	
	Toyama	579	1.0	
	Ishikawa	601	1.0	
	Fukui	422	0.7	
	Kyoto	1,202	2.0	
	Hyogo	2,330	3.9	
	Tottori	280	0.5	
	Shimane	352	0.6	
	Yamaguchi	687	1.1	
	Fukuoka	2,255	3.5	
	Saga	388	0.6	
	Nagasaki	630	1.1	

Interannual change of the Industrial Conditions



Interannual change of the Amount of Manufactured Goods Produced and Shipped



Interannual Change of the Number of Employees

Transportation – Traffic Volume (unit in million/year)

Prefecture	Freight tonnage		Number of	
	Business	Private	Bus	Car
Nationwide	2,882	2,556	6,490	40,027
NOWPAP Region	1,006	795	1,959	10,742
Hokkaido	350	129	345	2,274
Aomori	37	51	86	367
Akita	22	40	49	308
Yamagata	24	45	41	331
Niigata	54	87	133	454
Toyama	37	29	34	404
Ishikawa	35	25	61	422
Fukui	20	21	29	379
Kyoto	34	47	204	486
Hyogo	104	98	316	1,562
Tottori	15	23	30	322
Shimane	15	13	22	180
Yamaguchi	80	52	157	861
Fukuoka	111	86	361	1,639
Saga	39	29	57	469
Nagasaki	29	20	34	284

3. National Monitoring and Assessment Activities

(1) Air Pollution Monitoring System

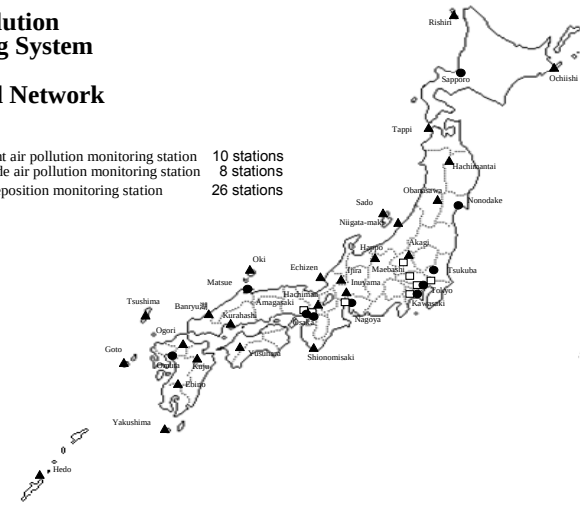
- **A. National Program**
- **B. Local Networks**
- **C. Hazardous Air Pollutants Survey**

(2) Environmental Investigation of Chemical Substances

(3) Long-term Monitoring of Acid Deposition

Air Pollution Monitoring System

A. National Network



B. Local Network

Prefecture	Regular Monitoring		Benzene			Dioxins	
	Ambient	Roadside	Ambient	Point of Release	Roadside	Ambient	Point of Release
Hokkaido	89	19	12	3	4	18	12
Aomori	13	4	2	0	1	6	6
Akita	22	5	4	1	2	10	1
Yamagata	17	1	2	0	1	2	2
Niigata	39	6	3	5	2	13	0
Toyama	25	6	3	2	1	10	6
Ishikawa	26	6	3	0	2	9	6
Fukui	38	4	2	2	1	6	6
Kyoto	29	9	3	1	5	19	4
Hyogo	74	30	12	3	4	32	6
Tottori	3	3	3	0	1	4	0
Shimane	7	2	2	1	1	10	1
Yamaguchi	34	1	5	0	0	14	0
Fukuoka	44	18	7	6	5	12	13
Saga	17	3	4	0	0	5	2
Nagasaki	23	5	3	0	4	10	2
Total	500	122	70	26	34	180	67

C. Monitoring Program for Hazardous Air Pollutants Survey

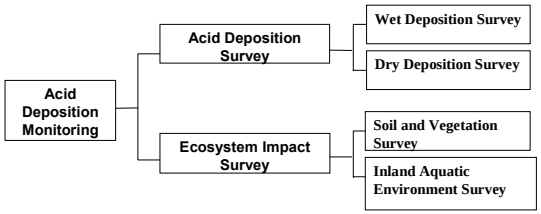
Substance	Standards	Monitoring
Acrylonitrile	2 mg/m^3	x
Acetaldehyde	-	x
Vinylchloride	10 mg/m^3	x
Chloroform	-	x
Ethyleneoxyde	-	x
1,2-Dichloromethane	-	x
Dichloromethane	150 mg/m^3	x
Tetrachloroethylene	200 mg/m^3	x
Trichloroethylene	200 mg/m^3	x
1,3-Butadiene	-	x
Benzene	3 mg/m^3	x
Benzo(a)pyrene	-	x
Formaldehyde	-	x
Mercury and its compounds	0.04 mg/m^3	x
Nickel and its compounds	0.025 mg/m^3	x
Arsenic and its compounds	-	x
Beryllium and its compounds	-	x
Manganese and its compounds	-	x
Chromium(VI) compounds	-	x
Chloromethylmethylether	-	-
Talc (containing Asbestos)	-	-
Dioxines	0.6 pg-TEQ/m^3	x

(2) Environmental Investigation of Chemical Substances

FY 1998 (7-16 points)		FY 1999 (6-16 points)		FY 2000 (8-15 points)		FY 2001 (7-16 points)		FY 2002 (34 points)	
Substance	Range* (ng/m^3)	Substance	Range* (ng/m^3)	Substance	Range* (ng/m^3)	Substance	Range* (ng/m^3)	Substance	Range* (ng/m^3)
Methyl bromide	49 - 340	1,2,3-Trichlorobennzene	0.018 - 11	1,4-Dioxane	15 - 1200	1,1,1-Trichloroethane	170 - 420	PCBs	16 - 880
Ethyl bromide	nd	1,2,4-Trichlorobenzene	0.12 - 40	Isobutyl acetate	73 - 710	1,1,2-Trichloroethane	20 - 27	HCB	57 - 3,000
Vinyl chloride	16 - 1300	1,3,5-Trichlorobennzene	0.036 - 1.4	Ethyl acetate	170 - 160000	Ethyl chloride	14 - 540	Aldrin	nd - 3.2
1,2-Dibromoethane	nd	1,2,3,4-Tetrachlorobennzene	0.039 - 0.94	Vinyl acetate	120 - 5500	Methyl chloride	750 - 16000	Dieldrin	0.73 - 110
2-Bromopropane	nd	1,2,3,5-Tetrachlorobennzene	0.015 - 0.65	Butyl acetate	110 - 13000	Dimethyl terephthalate	0.074 - 0.093	Endrin	nd - 2.5
1-Chlorobutane	38 - 1400	1,2,4,5-Tetrachlorobennzene	0.019 - 0.40	α-Methylstyrene	1.9 - 110	Diethyl terephthalate	0.16 - 0.22	*p,p'*-DDT	0.25 - 22
3,4-Dichloro-1-buthene	80	Pentachlorobennzene	0.012 - 1.1	cis-β-Methylstyrene + o-Methylstyrene + p-Methylstyrene	5.4 - 190	Methyl acrylate	nd	*p,p'*-DDE	0.56 - 28
Toluene	1100 - 85000	Hexachlorobennzene	0.013 - 1.1	m-Methylstyrene	2.6 - 190	Ethyl acrylate	0.6 - 1.8	*o,p'*-DDD	nd - 0.76
Chlorobenzene	20 - 160	Ethylbenzene	89 - 10000	trans-β-Methylstyrene	2.4 - 22	Acetonitrile	93 - 1200	*o,p'*-DDT	0.41 - 40
o-Xylene	330 - 9500	1,1-Dichloroethane	11 - 24	2-Ethoxyethanol	2.3 - 950	Diisononyl phthalate	0.42 - 22	*o,p'*-DDE	0.11 - 8.5
m-Xylene + p-Xylene	550 - 35000	1-Bromo-3-Chloropropane	20 - 34	2-Methoxyethanol	6.7 - 97	Di-i-decyl phthalate	0.30 - 1.3	*o,p'*-DDD	nd - 0.85
Stylene	39 - 2700	o-Dichloricide	34 - 420	2-Butoxyethanol	4.8 - 560	Diisotridecyl phthalate	nd	*trans*-Chlordane	0.62 - 820
Dichloromethane	280 - 24000	m-Dichloricide	23 - 370	Hexabromobenzene	0.031 - 0.1	Polybromodiphenylether	0.00007 - 0.067	*cis*-Chlordane	0.86 - 670
1,2,4-Trimethylbennzene	370 - 10000	p-Dichloricide	160 - 17000	Polychlorinated terphenyl	0.00092 - 0.0060	Bromodiphenylether	0.0004 - 0.0020	*trans*-Nonachlor	0.64 - 550
1,3,5-Trimethylbennzene	90 - 3200	Methyl-t-butyl ether	22 - 330	Monochloroterphenyl	0.00092 - 0.0060	Dibromodiphenylether	0.0002 - 0.012	*cis*-Nonachlor	0.071 - 62
Polychlorinated naphthalene (75 substances)	0.011 - 0.86	Benzo[e]pyrene	0.074 - 3.7	Dichloro-terphenyl	0.00055 - 0.0011	Tribromodiphenylether	0.00007 - 0.0079	Oxychlordane	nd - 8.3
Tris(2-chloroethyl) phosphate	0.3 - 1.4	Benzo[g,h,i]perylene	0.10 - 4.1	Trichloro-terphenyl	nd	Tetrabromodiphenylether	0.0005 - 0.010	Heptachlor	0.20 - 220
Tributyl phosphate	0.22 - 7.5	Benzo[b+j+k] Fluoranthene	0.36 - 7.8	Tetrachloro-terphenyl	nd	Pentabromodiphenylether	0.00010 - 0.0093		
Tricresyl phosphate	1.2 - 2.6	Dibenz[a,h] Anthracene	0.24 - 1.4	Pentachloro-terphenyl	nd	Hexabromodiphenylether	0.00011 - 0.011		
Bis(2-ethylhexyl) adipate	1.0 - 26	Pyrene	0.39 - 8.1			Heptabromodiphenylether	0.00021 - 0.038		
Methylnaphthalenes (2 substances)	3.2 - 310	Phenanthrene	1.6 - 29						
Dimethylnaphthalene(9 substances)	0.09 - 70	Fluoranthene	0.58 - 10						
Crotonaldehyde	15 - 330	Chrysene	0.26 - 3.9						
		Methyl methacrylate	28 - 170						
		Ethyl methacrylate	nd						
		PCBs	0.11 - 2.1						

Note: Number of sampling point is varied by the substances exept for FY2002.
* Detected range: minimum - maximum

(3) Long-term Monitoring of Acid Deposition

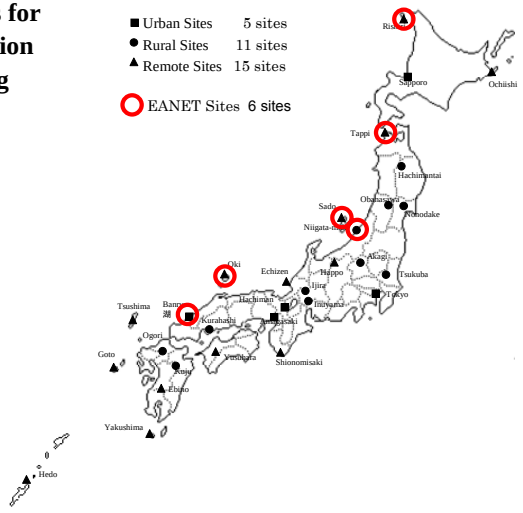


a) Wet Deposition (Precipitation)
Parameters: Electric Conductivity (EC), pH, Cl^-, SO_4^{2-}, NO_3^-, Na^+, K^+, Ca^{2+}, Mg^{2+}, NH_4^+
Frequency: daily
b) Dry Deposition
- Automatic measurement
Parameters: SO_2, O_3, NO_X and PM_{10} (partially as $PM_{2.5}$)
Frequency: Continuously, hourly average
- Manual measurement (EANET stations only)
Parameters: SO_2, HNO_3, HCl, NH_3 and particulate matter components
Frequency: weekly

A. Parameters on the Acid Deposition Monitoring

Name of Site	Prefecture	Classification	Measuring Parameter					Note
			NO_x	SO_2	O_3	PM_{10}	$PM_{2.5}$	
Rishiri	Hokkaido	Remote	○	○	○	○	○	EANET Site
Sapporo		Urban	○	○	○			
Tappi	Aomori	Remote	○	○	○	○		EANET Site
Sado-Seki	Niigata	Remote	○	○	○	○		EANET Site
Niigata-Maki		Rural						For Training
Echizen	Fukui	Remote						
Oki	Shimane	Remote	○	○	○	○	○	EANET Site
Banryu		Urban	○	○	○	○		EANET Site
Tsushima	Nagasaki	Remote			○			
Goto		Remote						

B. Locations for Acid Deposition Monitoring



C. Acid Deposition Survey

	Phase I '83 – '87	Phase II '88 – '92	Phase III '93 – '97	Phase IV '98 – '00	'01-'02
Number of sites Atmospheric Survey	34 ('83) 14 ('84, '85) 29 ('86, '87)	29	48	55	48
pH in average	4.4 – 5.5	4.5 – 5.8	4.4 – 5.9	4.47 – 6.15	4.34 – 6.25
Number of sites Soil Survey	12	43	88	20	18
Number of sites Lake Survey	133 (Screening)	5	33	17	12
Others		Snow Survey			

D.-1 Acid Deposition Monitoring Network in East Asia (EANET)

The objectives of EANET include the following:

1) To create a common understanding of the state of the acid deposition problems in East Asia;
2) To provide useful inputs for decision-making at local, national and regional levels aimed at preventing or reducing adverse impacts on the environment caused by acid deposition; and
3) To contribute to cooperation on the issues related to acid deposition among the participating countries.

D.-2 Major Activities of EANET

1) Implementation of acid deposition monitoring in the participating countries using common methodologies, such as:
   - wet deposition monitoring;
   - dry deposition monitoring;
   - soil and vegetation monitoring;
   - monitoring inland aquatic environment
2) Compilation, evaluation, storage and provision of data obtained through the EANET monitoring;
3) Promotion of quality assurance/quality control (QA/QC) activities to obtain high quality monitoring data;
4) Preparation and publication of periodic reports on the state of acid deposition in East Asia;
5) Promotion of research and studies related to acid deposition; and
6) Other activities necessary to achieve the objectives of the Network.

E.-1 Methodology (Air Pollution Monitoring)

Parameter	Method		Reporting limit
SO_2	JIS B 7952	Conductometric Ultraviolet fluorescence	0.001 ppm
NO_x	JIS B 7953	Absorptiometry Chemiluminescene	0.001 ppm
O_x	JIS B 7957	Absorptiometry Ultraviolet absorption	0.001 ppm
SPM	JIS B 7954	Beta-ray absorption	0.001 mg/m^3
HC	JIS B 7956	Hydrogen flame ionization method	0.1 ppm-C
CO	JIS B 7951	Infrared absorption method	0.1 ppm

E.-2 Methodology (Acid Deposition Survey)

Analysis item	Instrumental Method
Electric conductivity (EC)	Conductivity Cell
pH	Glass electrode
Anions (Cl^-, NO_3^-, SO_4^{2-})	Ion Chromatography
Ammonium ion ($NH4^+$)	Ion Chromatography Spectrophotometry (Indophenol blue)
Cations (Na^+, K^+, Ca^{2+}, Mg^{2+})	Ion Chromatography Atomic Absorption Spectrometry

F. Research Activities

Theme 1: Aircraft observation research above the sea around Japan (1990 – 2001)

Theme 2: Research on long-term monitoring of air pollutants, like ozone and aerosols (1990 – 2001)

Theme 3: Development of long-range transportation model for "acid rain" (1993 – 1998)

Theme 4: Research on **source inventory of air pollutant** in the East Asian region (1996 – 2004)

Theme 5: Research on the source-receptor matrix using the long-range transportation model (1999 – 2004)

Theme 6: Aircraft observation research in China (2001 – 2005)

G.-1 Training Activities

(1) National Environmental Research and Training Institute

1) Environmental administration

2) International cooperation

3) Measurement and analysis

4) Environmental official training

5) Administrative practice

G.-2 Training Activities

(2) Acid Deposition and Oxidant Research Center (ADORC)

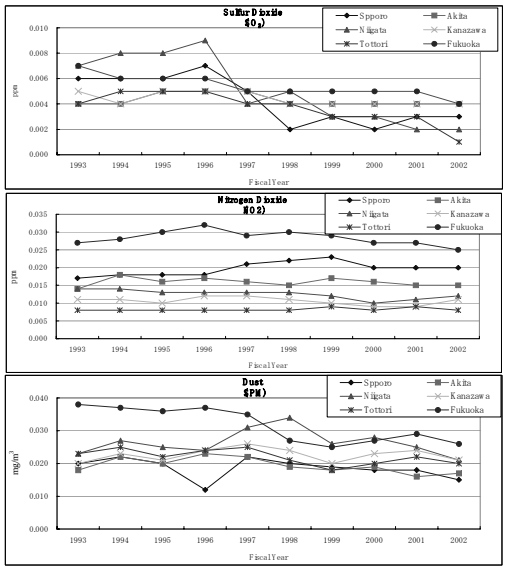
ADORC has conducted the following training program as part of tasks for the National Center and the Network Center of EANET.

- 1) Execution of individual training
- 2) Dispatching of technical mission
- 3) Holding of training workshop

4. Present Status (1) Air Pollution

Annual average in 2002

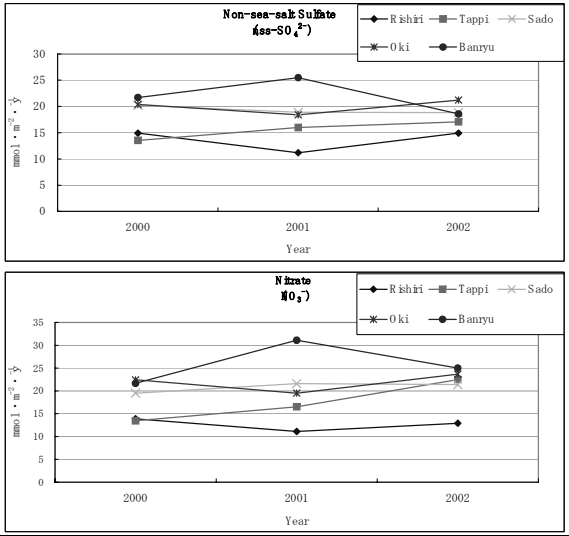
Parameter	Major cities within the subject region											
	Asahikawa	Sapporo	Akita	Sakata	Niigata	Toyama	Kanazawa	Fukui	Tottori	Matsue	Kitakyusyu	Fukuoka
SPM (mg/m^3)	0.018	0.012	0.017	0.018	0.023	0.025	0.021	0.025	0.02	0.02	0.029	0.031
NO_2 (ppm)	0.044	0.048	0.023	0.015	0.028	0.025	0.025	0.029	0.017	0.011	0.039	0.036
SO_2 (ppm)	0.003	0.004	0.002	0.002	0.003	0.003	0.004	0.004	0.001	0.001	0.004	0.004
O_x (ppm)	0.018	0.026	0.033	0.037	0.032	0.035	0.034	0.029	0.033	0.039	0.027	0.031
NMHC (ppm)	-	0.2	0.14	-	0.16	-	0.12	0.12	0.1	0.09	0.18	0.2



4. Present Status (2) Acid Deposition

(mmol m^{-2} $year^{-1}$ in 2002)

Name of Site	nss-SO_4^{2-}	NO_3^-	Cl^-	NH_4^+	Na^+	K^+	nss-Ca^{2+}	Mg^{2+}	H^+
Rishiri	14.9	12.9	207	19.2	188	4.86	5.66	21.4	14.4
Tappi	17.1	22.5	253	19.6	219	5.41	7.3	26.1	27.8
Sado	18.8	21.4	439	20.7	384	9.3	4.86	44	32.5
Oki	21.2	23.7	658	19.5	570	15	6.14	63.8	29.2
Banryu	18.6	25	116	23.4	104	3.76	4.76	12.1	26.5



5. Recommendations for Future Activities (1)

- **1) The impact caused by acid deposition is hard to comprehend without a long-term monitoring survey. In the case of small lakes and soils with little buffering capacity, the effects of acid deposition due to long-term exporsure appear suddenly. Therefore, a long-term, continuous monitoring survey for acid deposition should be required.**
- **2) Because it is deemed necessary for the countries of eastern Asia to take measures to address acid deposition, assistance in establishing monitoring networks for acid deposition should be implemented by coordinating investigative activities through EANET.**

5. Recommendations for Future Activities (2)

- **3) In order to assess the impact of acid deposition on ecosystems, a comprehensive monitoring system which covers the air, vegetation, soil and inland aquatic environments should be established. Further, an integrated monitoring system for watersheds suspected of being impacted by acid deposition is required.**
- **4) Investigation/research required in the future are: [1] investigation on the mechanisms by which acid deposition impacts ecosystems, [2] investigation on mechanisms of long-range transportation of air pollution, and [3] development of a comprehensive assessment model for the acid deposition problems in the east Asia.**

6. Conclusion

This report summarizes current research on atmospheric deposition of contaminants in Japan and the monitoring data collected within the NOWPAP region.

Two types of monitoring program are in progress to grasp the atmospheric deposition in Japan:

1) Air Pollution Monitoring System
   - Continuous monitoring system for air pollutants, such as SO_2, NO_2 and SPM in concentration in accordance with the Air Pollution Control Law
   - Monitoring program to evaluate environmental hazards from chemical substances, in accordance with the Chemical Substances Control Law
2) Acid Deposition Survey program
   - Long-term program for measures against acid deposition, including of wet deposition and dry deposition survey

• Monitoring results collected by the Air Pollution Monitoring System in the major cities of the object region are; 0.012 – 0.031 mg/m^3 in SPM, 0.001 – 0.004 ppm in SO_2, and 0.011 – 0.048 ppm in NO_2. Each pollutant appears a trend of gradual decrease or a level-off year by year.

• Meanwhile, the annual amounts of wet depositions, non-sea-salt sulfate, nitrate and ammonium, of the in Japanese NOWPAP region are in the range of 10 – 25 mmol/m^2 yr in the years from 2000 to 2002.

• A series of research projects related to acid deposition, such as source inventory of air pollutant, aircraft observation and the long-range transportation model, are implemented by NIES and other related institutes and organizations.

Based on a series of survey results of acid depositions recorded over two decades, the Committee on Acid Deposition and Its Effect indicated the followings as investigation/research required in the future:

- Investigation on the mechanisms by which acid deposition impacts ecosystems
- Investigation on mechanisms of long-range transportation of air pollution
- Development of a comprehensive assessment model for the acid deposition problems in eastern Asia.

Appendix II

National Report of China on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region
By National Expert of China

National Reports on Atmospheric Deposition of Contaminants into the Marine and Coastal Environment in NOWPAP Region of China

Chinese expert group

Vladivostok, 10th Oct. 2005

1. **Introduction(1)**

The NOWPAP regions have been marked in the Fig.1, which mainly include the five provinces: Heilongjiang, Jilin, Liaoning, Shandong and Jiangsu from North to South. The total land surface area of the basin and the total length of the coastline is about 1,004,000km^2 and 6054 km, respectively. The regional area accounts for 10.8% of the entire area of China. The number of major rivers in these basins is *7*, and the amount of a total discharge was about 1193.1 billion tons/year in fiscal year 2002.

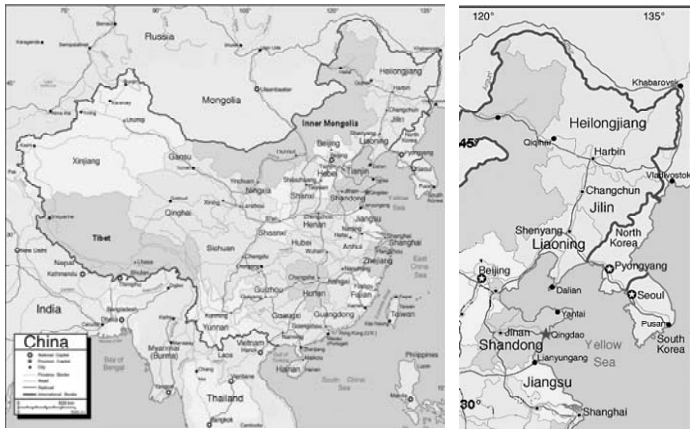


Fig.1 Geographical Outline of the NOWPAP Region

1. Introduction(2)

Major cities, rivers and coastline

The major cities include Harbin, Changchun, Shenyang, Dalian, Yantai, Qingdao, Lianyungang and Shanghai, whose locations have been noted in Fig.1. The red line is the coastline of the appointed region. The GDP from the related provinces is up to 3784 billion RMB, which 36.5% of the nationwide total, and industrial output keep increasing up to now.

The major rivers of the region include onghua River, Liao River, Yellow River, Yangtse River, Huai River and Hai River.

Fig.2 The major rivers and cities in this region

Table 1 Annual discharge of major rivers

Items	Songhua River	Liao River	Hai River	Yellow River	Huai River	Yangtse River
Area(10^4m^2)	55.7	22.9	26.4	75.2	26.9	180.9
Length(km)	2308	1390	1090	5456	1000	6300
Annual precipitation (mm)	527	473	559	475	889	1070
Average discharge (billion m^3)	76.2	14.8	22.8	65.8	62.2	951.3

Climate systems

Climate of Jiangsu province and Shandong province belong to warm temperate zone half moist continent monsoon climate, four seasons distinct. South wind is popular in Summer of Shandong province and Jiangsu province is often attacked by Typhoon. The average value of annual temperature of the two provinces is above 5 ℃. The annual precipitation value of Jiangsu province is about 1000mm, while 550～950mm of Shandong province.

The other three provinces belong to temperate continental monsoon climate with more drought and cloudy days in Spring and hot and rainy days in Summer. The winter days last longer than other provinces of China. Of the three provinces, annual precipitation of Liaoning province is most abundant with 600-1100mm.

Physical geography

The major relief of Jiangsu, Shandong and Liaoning are hilly and plain regions, while mountanious regions cover a big proportion in the other two provinces. Besides, water area of Jiangsu is quite large with 17% of the whole province.

The vegetation rate of Liaoning，Heilongjiang and Jilin is separately 28.7% , 41.9% and 42.4%. Contrast with the three provinces, the vegetation rate of the other two provinces is much lower with 21.5% of Shandong and 10.56% of Jiangsu.

Of the five provinces, Heilongjiang and Liaoning is abundant in protected natural areas with a total number 84 and 81 separately, covering 2.3 million hectares occupying 5.05% area of whole province and 2.848 million hectares occupying 9.7% area of the whole province separately. Secondly, there are 66 protected natural areas in Shandong covering about 6% area of whole province. At last, number of Jiangsu and Jilin is relatively fewer with 26 and 27 separately covering 0.738 million hectares and 1.846 million hectares.

Overview of social and economic situation

Province	Square, km²	GDP per capita, USD/person	Population (million)
Jiangsu	100,000	2102	74.058
Shandong	150,000	1703	91.250
Liaoning	150,000	1782	42.10
Jilin	180,000	1166	27.037
Heilongjiang	460,000	1453	38.15

Industrial condition of major provinces(2002)

Heilongjiang : 193.5 billion RMB, increased by 11.0%, green food , etc.

Jilin : 1445.5 billion, increased by 70.1%, resources exploitation and manufacturing industry, etc.

Liaoning: 490.48 billion RMB, increased by 15.3%, metallurgy industry, oil and petrifaction industry and electronics manufacturing industry , etc.

Shandong : 350.2 billion RMB, increased by 17.3% , heavy industry and light industry , etc.

Jiangsu: 482.01 billion, increased by 14.0%, textile industry, electronics industry, chemicals manufacturing industry, etc.

Energy

The total energy consumption in 2002 is about 1.5 billion tons of coal, which has added 0.5 billion tons than that of 1990 with an average annual rate of 3.6%. Of which, coal occupies 66.3%, petrol occupies 23.5%, natural gas occupies 2.6% and water-electricity and nucleus energy occupies 7.6%.

Nearly 70% coals are not completely burned, which caused SO_2 and dust emission and led to acid rain finally. High grade energy such as petrol and natural gas occupied 33.7% of the whold energy consumpition in 2002, which has incresed by 9.9% than 1990. While, the energy consumption level is still lower than developped countries with the energy consumption per capita is 156 KWh, which is only 7.7 % of Japan and 4% of USA.

The status of legal about ambient air quality monitoring in China(1)

(1) Central government

- Constitute national laws for ambient air protection and ambient air monitoring
- Issue national standards for ambient air quality and standard methods for ambient air quality monitoring
- Establish national environmental monitoring network to implement ambient air quality monitoring
- Supervise the implementation of national ambient air quality monitoring

The status of legal about ambient air quality monitoring in China(2)

(2) Provincial government and large municipal government

- Implement national legal requirements and standards for ambient air quality
- Constitute local laws and standards for ambient air quality if need
- Be responsible for locus ambient air monitoring including establishment of local monitoring center and local environmental monitoring network
- Supervise the implementation of ambient air quality monitoring in district

The status of legal about ambient air quality monitoring in China(3)

(3) Municipal government directly under province

- Implement national legal requirements and standards for ambient air quality
- Implement local legal requirements and standards for ambient air quality
- Be responsible for urban ambient air monitoring including establishment of urban monitoring center and urban environmental monitoring network in district

The status of legal about ambient air quality monitoring in China(3)

(3) Municipal government directly under province

- Implement national legal requirements and standards for ambient air quality
- Implement local legal requirements and standards for ambient air quality
- Be responsible for urban ambient air monitoring including establishment of urban monitoring center and urban environmental monitoring network in district

The status of legal about ambient air quality monitoring in China(4)

(4) Municipal government (county-level) and county government

- Implement national legal requirements and standards for ambient air quality monitoring
- Implement local legal requirements and standards for ambient air quality
- Be responsible for county ambient air monitoring including establishment of county monitoring station in districts

National monitoring and research activities related to atmospheric deposition of contaminants --- National programmes

Environmental quality monitoring began in 1970s.

Total of 2356 of environmental monitoring stations , 46515 people.

One national environmental monitoring center, namely China National Environment Monitoring Center (CNEMC).

Provincial level, city level and county level environmental monitoring centers are 40, 401 and 1914

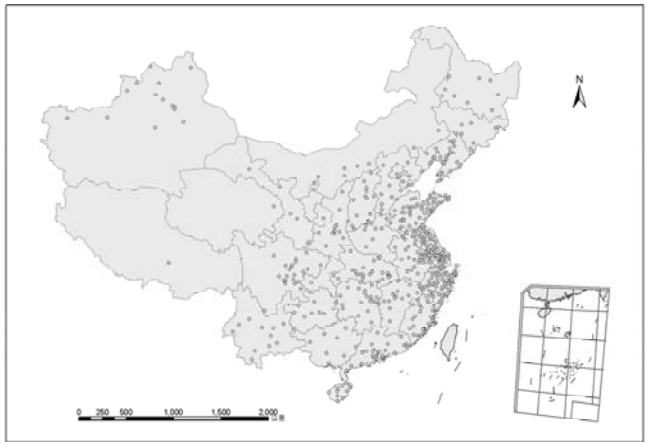
In China, the air pollution monitoring work is mainly carried out by cities.

There are more than 1800 of city/county environmental monitoring stations which have the capabilities on air quality monitoring in China.

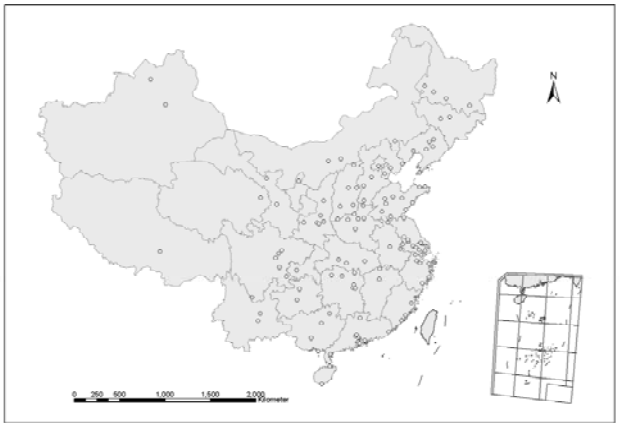
343 city/county monitoring centers report air quality data to CNEMC every year.

118 cities reporting the automatic-monitored data to CNEMC everyday

The locations of cities (counties) that report air quality data to CNEMC annually



The locations of cities(118) which report automatic monitored air quality data to CNEMC every day



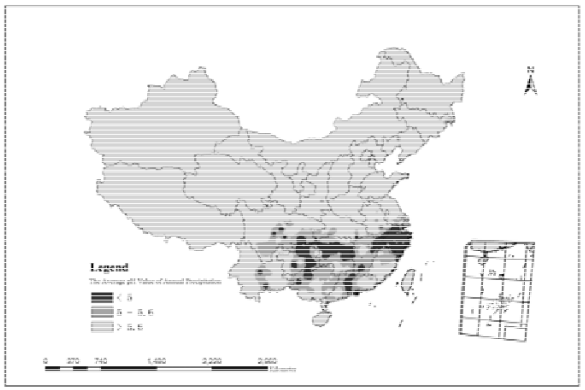
National programmes

A national wide acid rain investigation in 2002.

- 698 cities/counties
- 1207 acid rain monitoring sites are set up for the investigation,
- 803 sites locate in urban area
- 404 sites locate in rural area.
- In order to clarify the spacial distribution and pollution degree of acid rain, it is decided by SEPA that the investigation will be continued in 2004 and 2005 year.

Acid rain mainly occurs in areas to the south of Yangzi River and east of Tibet Plateau，and there is also acid rain in some part of the north China..

Spacial distributions on annual average pH value of precipitation in China in 2002



Frequency of observations at different monitoring stations

Items of monitoring	Frequency
Air pollution	Daily
Precipitation composition	Daily
Snow cover composition	Daily
Precipitation acidity	
EANET, dry deposition	Daily
EANET, wet deposition	Daily

Methodologies

The methods of ambient air quality monitoring have been established for the past 20 years in China.

- 《Technical Regulation for Environmental Monitoring》 1986. It is criterion for the monitoring of atmosphere, water, bodies of water, noise and radioactivity.
- 《Analytical Methods for atmosphere and emission source》, 1990. There are 148 methods for 80 parameters in the handbook.
- 《Handbook for QA/QC of ambient air quality monitoring》
- 《Technical Regulation For Urban Ambient Air Quality Daily Report》(will be issued)
- 《Technical Regulation For Urban Ambient Air Quality Forecast Report》(will be issued)
- National Standards of Ambient Air Quality Monitoring Methods

Monitoring parameters and analytical methods used (air pollution measurements)

		Measurement range (ppm)	Accuracy (ppm)
TSP	Gravimetric method	1-10 mg/m^3	0.001 mg/m^3
CO	Non diffused Ir spectrometry	0-50	0.5
NO	Chemiluminescence detection method	0-0.5	0.002
NO_2	Chemiluminescence detection method	0-0.5	0.002
NOx	Chemiluminescence detection method	0-0.5	0.002
SO_2	Ultraviolet fluorescent method	0-0.5	0.002
PM_{10}	β-ray, or TEOM	0-10 mg/m^3	0.001 mg/m^3
O_3	Ultraviolet photometric method	0-1	0.002

Monitoring parameters and analytical methods for acid deposition

Parameter	Method	Measurement range umol/l	Accuracy umol/l
NH_4	Ion chromatography	3-1000	1
NO_3	Ion chromatography	1-100	0.3
Na	Ion chromatography	2-900	1
K	Ion chromatography	1-100	0.3
Ca,	Ion chromatography	0.5-300	0.2
Mg	Ion chromatography	1-200	0.4
pH	pH meter	-	0.05
Conductivity	conductivity cell	-	-
SO_4	Ion chromatography	1-200	1
Cl	Ion chromatography	1-1000	1

Research activities and international cooperation

(1) The cooperation projects between USA and China
Research on Air Pollution's Impact on Human Breath Health
The applied research on FTIR in toxic atmospheric contaminants monitoring
Research on PAHs exposure and metabolize assessment

(2) Monitoring system standardization construction---The joint research with France-National Air quality Monitoring System

(3) The joint research with Norway-State Environmental Monitoring Information System building during

(4) The joint research with Japan on "State Environmental Monitoring Strategy in 21st century", " Wet-deposition Monitoring Quality Assurance", " East-Asia Acid Deposition Monitoring System", etc.

(5) East-Asia acid deposition monitoring system- branch monitoring station of China during 1998 to now.

(6) Global Environmental Monitoring Network (GEMS) during 1992-1997

Training activities

(1) Training class on fixed air pollution source monitoring and sampling in 1992.

(2) Workshop on environmental monitoring was conducted with Environmental Institute of Canada.

(3) Workshop on environmental monitoring between China, USA and Japan

(4) Organic contaminants workshop between China and USA.

(5) During the construction of East-Asia depostition monitoring network, monitoring workers at each monitoring centers are trained with QA/QC in Aug. 1999.

(6) ENSIS workshop between China and Norway was conducted in Mar, 2001.

(7) The seminars on China-Japan cooperation since 1997

Relative international meetings such as：NOWPAP project, the joint environmental survey of Yellow Sea conducted by China and Korea, East-Asian Sea and GPA project, etc.

Present situation of atmospheric deposition of contaminants

In 2002, according to 343 cities (counties) reports and the National Ambient Air Quality Standard (NAQAS):

Grade II, 116 cities, 33.8% of the total. Among them are 11 cities such as Haikou that are graded as I.

120 cities are graded as III, 35.0% and 107 as grade III plus for 31.2%.

Particulate is the dominating pollutant which affects urban air quality. 63.5% of cities fail to meet the national standard for Grade II air quality, in respect of TSP or PM10 annual mean. In general, particulate pollution in the north is more serious than in the south.

Grades of Particulate Concentration in Cities

Ritio concentration degree		1998	2000	2002
Grade II (compliance)，%		**32.1**	**36.9**	**36.5**
worse than Grade II，%		**67.9**	**63.1**	**63.5**
	among which worse than Grade III %	**37.7**	**30.3**	**29.8**
national TSP average（mg/m³）		**0.289**	**0.270**	**0.268**

Plan and activities for air pollution control(1)

(1) "Five-year plan" of China

- There is a controll and protection plan about "acid rain controll zone and SO_2 emission zone" constituted by centery government for 2000-2005.
- There is a controll and protection plan of air plan for113 key cities constituted by centery government

(2) Capability building on city air quality automatic monitoring system

Air quality should be automatic monitored in all cities in China in recent three years. Hitherto, 208 cities have established their air quality automatic monitoring system. 42 cities will finish building automatic monitoring system in the end of 2004; there are still 29 cities that have no air quality automatic monitoring system.

Plan and activities for air pollution control(2)

(3) Distribution plan of quota for SO_2 emission control

The distribution plan of quota for SO_2 emission controll in electric power industry has carried in Jiansu for controlling SO_2 emission.

(4) Beijing clean air action

Beijing government constituted a plan to modify the Beijing air quality, and the rate the days of Grade II (compliance) is over 55% at 2002.

(5) SO_2 emission controll

3800 projects were finished about reducing SO_2 emission in the end of 2002

(6) The cars emission controll

SEPA publiced 3 catalogues for 300 new car incoulding emissions standard in 2002.

Recommendations for future regional activities and priorities

(1). Strengthening dust and sand storm monitoring

(2) Strengthening monitoring information system

(3) Essential training for monitoring workers

(4) Enhance the legislation construction

(5) Control secondary pollution

(6) Promote ecological environmental construction

Conclusions

In 2002, 343 cities (counties) reported air quality monitored data to CNEMC in China. Among them, 116 cities have met the National Ambient Air Quality Standard (NAQAS) for Grade II, which accounts for 33.8% of the total. 120 cities are graded as III, which counts for 35.0% and 107 as grade III plus for 31.2%. Particulate is the dominating pollutant which affects urban air quality. 63.5% of cities fail to meet the national standard for Grade II air quality, in respect of TSP or PM10 annual mean.

Acid rain mainly occurs in areas to the south of Yangzi River and east of Tibet Plateau in China.

Appendix III

National Report of Korea on Atmospheric Deposition of contaminants into the marine and coastal environment in NOWPAP Region

By National Expert of Republic of Korea

Northwest Pacific Action Plan

National Report of Korea on Atmospheric Deposition of contaminants into the marine and coastal environment in NOWPAP region

10-11 Oct. 2005

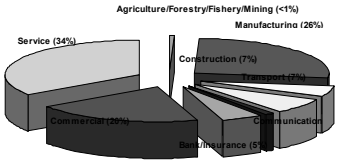
POMRAC WG1 meeting , Vladivostok, Russia

Social and Economic situation

❑ Industrial Activity

✓**In the course of last three decades, Korea has undergone dramatic economic growth. Real gross domestic product (GDP) has grown at an average annual rate of 7.3% between 1999 and 2002**

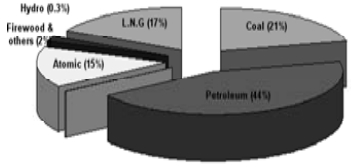
✓**The three major industrial activities in Korea were service, commercial and manufacturing. The leading industries include shipbuilding, semiconductors, electronics and auto manufacturing. However, the current Korean agriculture and fisheries industry are facing great challenges.**



❑ Energy

✓**Korea's primary source of energy are fossil fuels (coal, oil, and natural gas) and it is accounting for 83 percent of current Korea fuel use Energy: oil counted for 44% of the fuel mix, coal 21%, nuclear power 15%, LNG 17%, hydro-power and others 2%. Korea, the world's fourth-largest oil buyer, relies on imports for crude oil. Korea imports 97 percent of its energy.**

✓**The Korean government, has extended nuclear energy development as a reliable alternative energy source, especially after experiencing the oil shocks of the 1970s.**

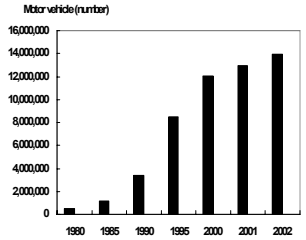


❑ Transportation

✓**The emissions of mobile sources contribute greatly to air pollution nationwide and are the primary cause of air pollution in many urban areas. The number of motor vehicles in Korea totaled 14 million by 2002. Among them, 94.5% was private motor vehicles.**

✓**The Ministry of Environment announced the proportion of low emission vehicles to be supplied in the Metropolitan area in 2005(12 percent on buses and 1.3 percent on the rest of vehicles). It's goal is to reduce 14 ton of the air-polluting substances in the vehicle sector by 2014 .**

❖ **The announcement is base on the Special Measures for Metropolitan Air Quality Improvement to improve the air quality in line with its level of the OECD counties within 10 years.**



National Monitoring and Research Activities related to Atmospheric Deposition of Contaminants

❑ National programme

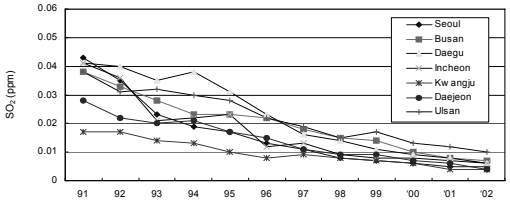
Network	Number of sites			Monitoring Items	Frequency
	Total	MOE	Local government		
Local air monitoring	174 (57 cities, provinces)	63 (32 cities, provinces)	98 (33 cities)	SO_2, NO_x, O_3, CO, PM_{10}, Wind speed, Wind direction, Temp., Relative humidity	Continuous/1hr
Road side monitoring	17 (7 cities)	1 (3 cities)	16 (7 cities)	SO_2, NO_x, O_3, CO, PM_{10}, Wind speed and direction, Temp.	Continuous/1hr
Acid rain monitoring	28 (28 cities, provinces)	28 (28 cities, provinces)	-	pH, Precipitation, Conductivity, Ion-concentration	Rainy day
National background monitoring	5 (5 cities, provinces)	5 (5 cities, provinces)	-	SO_2, NO_x, O_3, CO, PM_{10}, Wind speed and direction, Temp.	Continuous/1hr
Local background monitoring	11 (9 cities, provinces)	8 (8 cities, provinces)	3 (1 city)	SO_2, NO_x, O_3, CO, PM_{10}, Wind speed and direction, Temp.	Continuous/1hr
Air heavy metal monitoring	40 (12 cities)	-	40 (12 cities)	Pb, Cd, Cr, Cu, Mn, Fe, Ni	Five times/month
Hazardous atmospheric network	16 (11 cities)	16 (11 cities)	-	VOCs (12 items), PAHs (7 items)	Four times/year
Photochemical pollutants	15 (7 cities, provinces)	8 (7 cities, provinces)	7 (1 city)	VOCs (56 items)	Continuous/1hr
Visibility	2 (2 cities)	-	2 (2 cities)	Visibility	Continuous/1hr
Global air quality	1 (1 province)	1 (1 province)	-	CO_2, CH_4, N_2O (CFCs)	Continuous/1hr
Total	**307 (71 cities, provinces)**	**73 (29 cities, provinces)**	**236 (48 cities, provinces)**		

- **After monitoring, the data collected at these sites are electronically transmitted via a telemetry monitoring system (TMS) to MOE and local Environmental Offices.**
- ❖ **National Institute Environmental Research (NIER) is responsible for the control of database on the all automatic air pollution monitoring data observed.**

- **The real time air quality is measured at 16 sites in 10 major cities. Monitoring devices installed inside smokestacks of many factories measure concentrations of SOx, NOx, NH3, HCl, HF, and CO in every five minutes and relay the data to MOE and local Environmental Offices.**
- ❖ **Real-time monitoring data are provided on the web site of NIER (http://www.nier.go.kr) for general parameters, and publishes annual reports for air quality.**

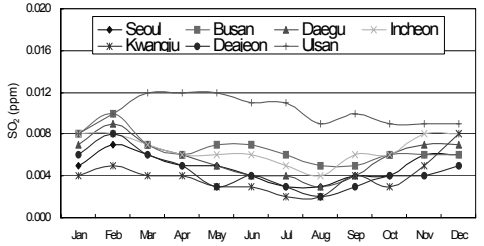
Air Quality Monitoring results: <Sulfide oxygen (SO_2)>

Yearly variation



✓**The contamination of SO_2 in the air of Korea has showed the decreasing trend since 1990s due to air pollution reduction policies of the government such as the use of clean fuels, expanded supply of low sulfur fuels, and introduction of low-emission vehicles.**

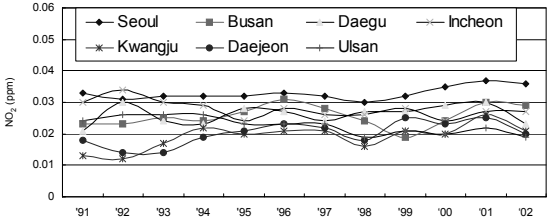
Monthly variation



✓**The SO_2 concentration is high in winter and low in summer, showing the typical trend of primary pollutants. The high in winter is owing to the stratification of atmosphere and low in summer is owing to the rain. The figure shows that the city of Ulsan and Incheon are relatively high SO_2 concentration than other cities.**

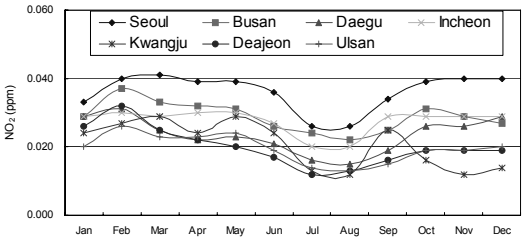
<Nitrogen oxygen (NO_2)>

Yearly variation



✓**The levels of NO_2 in the air of Korea did not show any improvement over the years. This trend is observed possibly by the increasing number of automobiles and vehicles.**

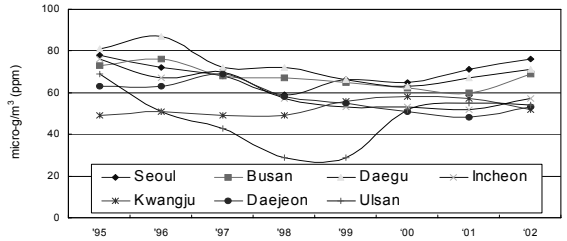
Monthly variation



✓**Seoul, which has the most in number of automobiles, shows the highest NO_2 concentration of all the cities. The monthly variation of NO_2 concentration in major cities shows the similar trend as SO_2**

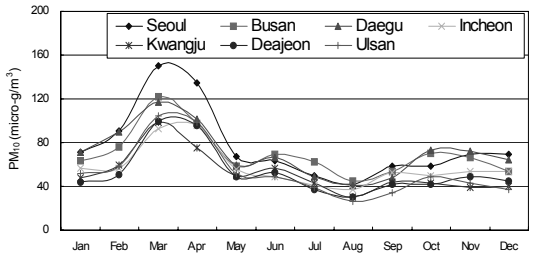
<Dust (PM_{10})>

Yearly variation



✓**Total suspended particles (TSP) levels were measured in major cities in Korea from 1984. However, since 1995, TSP measurement has begun to replace with PM_{10} measurement due to its adverse. PM_{10} measurement has short history. To examine the long time trend of concentration, the measurement data should be accumulated for some time.**

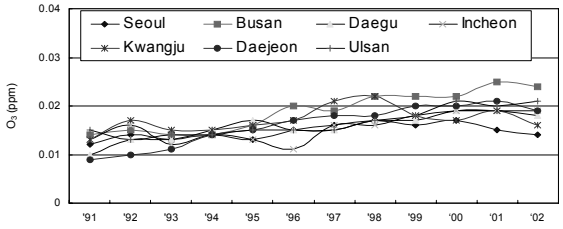
Monthly variation



✓**The seasonal variation in PM_{10} concentration showed the low concentration in summer due to rain.**

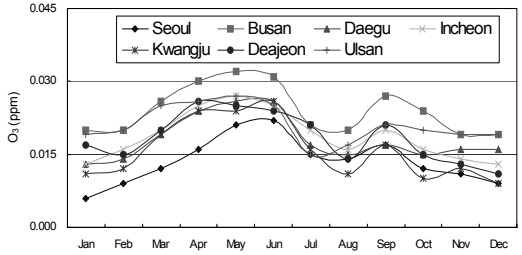
<Ozone (O_3)>

Yearly variation



✓**The levels of O_3 has been increasing for all major cities of Korea over the past years, however, in recent years, O_3 has kept a similar level since 1997.**

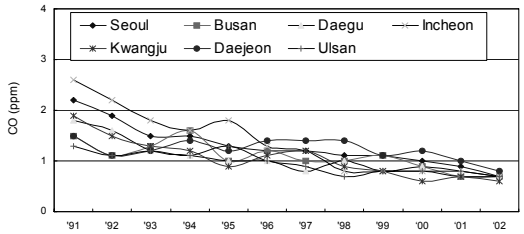
Monthly variation



✓**The seasonal variation of O_3 concentration revealed that the spring is the highest among other seasons. Busan reports relatively high concentration due to relatively warmer than other cities.**

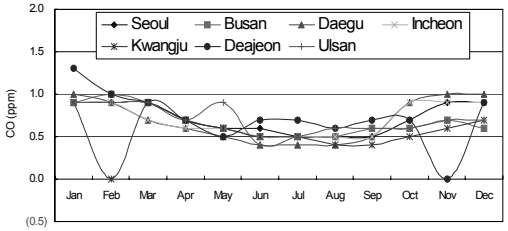
<Carbon Mono-oxide (CO)>

Yearly variation



✓**In general, the levels of CO in the air of Korea showed the decreasing trend since 1990s. This is due to the government effort including the use of clean fuels and the development of combustion processes for various coal based fuels.**

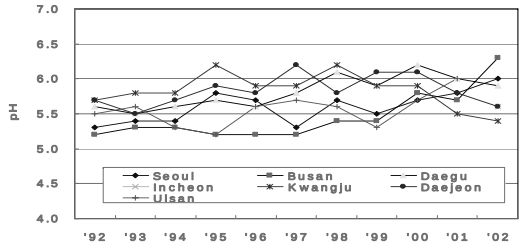
Monthly variation



✓**Monthly variation of CO concentration showed the typical primary pollutant pattern. Except for the rainy season during the summer, there is not much variation in CO concentration in major cities.**

<Acid rain>

Yearly variation



✓**The pH trend in Korea over the past years showed a large fluctuation. As can be seen in this figure, strong acid rain was not measured in all stations.**

<Yellow sand dust >

Yearly yellows sand dust observation in Seoul

Year	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02
Duration(days)	3	11	8	14	0	13	1	1	13	6	10	27	16
Frequency	1	3	3	5	0	4	1	1	3	3	6	7	7

✓**Yellow sand dust originated from P.R. China is very serious problem in Korea due to its impact on health and aesthetic conditions. Although it is hard to tell whether it is increasing or not, the duration is clearly increasing. Thus, Korea puts significant efforts to reduce the yellow sand dust internally and internationally. Joint project between China and Korea is on going for the reduction of trans-boundary environmental issues.**

<Heavy metal >

Heavy metal concentration in major cities in Korea (2002)

City	Pb	Cd	Cr	Cu	Mn	Fe	Ni
Seoul	0.0932	0.0036	0.0252	0.2660	0.0629	1.6297	0.1342
Busan	0.0751	0.0025	0.0098	0.2491	0.0698	1.8372	0.0118
Daegu	0.0698	0.0029	0.0168	0.4005	0.0675	1.9523	0.0179
Incheon	0.1059	0.0071	0.0130	0.2273	0.1145	2.8999	0.0194
Kwangju	0.0331	0.0016	0.0130	0.1572	0.0403	0.9735	0.0072
Daejeon	0.0492	0.0009	0.0020	0.0434	0.0307	0.7141	0.0097
Ulsan	0.0634	0.0052	0.0099	0.1455	0.0568	1.3254	0.0152

✓**The heavy metal concentrations were below the limit set by Ministry of Environment.**

❑ Methodologies/Procedure

Parameters		Analytical methods	Monitoring network
SO_2		Pulse U.V Fluorescence method	Local network Road side National background Local background
CO		Non-dispersive Infrared method	
NO_2		Chemiluminiscent method	
O_3		U.V Photometric method	
Dust	TSP	Beta-ray Absorption method	
	PM_{10}	Beta-ray Absorption method	
Pb, Cd, Cr, Cu, Mn, Fe, Ni (Dry Deposition) Al, Si, Ca, Mg (Yellow sand)		Atomic Absorption Spectrometry, ICP-MS, High volume air sampler	Heavy metal
PH conductivity Cl, NO_3, SO_4, HH_4, pH Na, K, Ca, Mg		Glass electrode Conductivity cell Ion chromatography Ion chromatography, Indophenol Ion chromatography, AAS	Acid rain

✓**Korea adopted Type Approval System for the QA/QC of air quality measurement analyzers. Only approved analyzers can be used as official ambient quality measurement analyzers. Agencies, which are legally licensed by the government can implement the periodic precision test once a year. MOE regularly updates the information on methodologies and equipments for the tests.**

❑ Research activities

✓**The Advanced Environmental Monitoring Research Center (ADEMRC) in Gwangju Institute of Science and Technology (GIST) is actively conducting the basic research on air quality monitoring technology, remote sensing technology, manpower producing, and international cooperation. The center is currently funded by the Ministry of Science and Technology (MOST) for $1M/year for 9 years.**

✓**Ministry of Environment set up $1M/year for 5 year to tackle the prevention of yellow sand dust. Also, UNEP and ESCAP provided the GEF fund for $1M for joint project with China, Japan, and Mongolia.**

✓**The Ministry of Maritime Affairs and Fisheries (MOMAF) launched the research project to search the effect of yellow sand dust on the marine ecosystem. The project is sponsored by MOMAF for $300,000/year for 6 years**

✓**From the year 2000, 12 individual research projects were funded for the total of $476,000 and 10 medium size (2~3 professors involved) research projects were funded with the total of $2M by Korea Science and Engineering Foundation (KOSEF), which is a subsidiary of Ministry of Science and Technology (MOST).**

❑ Training activities

✓**Most of the training activities are incorporated with the research projects such as ADEMRC. The center hosted training courses and field experiments. Up to now, center produced more than 100 skilled trainees.**

Present Situation

❑ Present Situation

✓**The current air quality of Korea is very stable compared to the previous years. Also, the air quality is slowly improving. This may be due to the strong air quality regulations, systematic monitoring, NGO's participation in air quality campaign, and governmental efforts. However, Korea is still serious about the air quality because of limited size of the territory.**

✓**With the activation of the Kyoto protocol of United Nations Framework Convention on Climate Change (UNFCCC), Korea tries hard to innovate the energy consumption and generation. Korea is one of most energy consuming countries in the world. Korea launched the strategic action plan for the UNFCCC. These efforts may result in the reduction of air quality deteriorating agents due to the clean energy development and sustainable consumption of energy sources in the future.**

Recommendation for future regional Activities and Priority

❑ Future regional activities and priority

✓ **Construction of regional database on the scientific data obtained in the national air pollution monitoring and information on the national air pollution control policy**

✓**Establishment of national and regional strategies to resolve capacity cap among countries (QA/QC through inter-calibration, Capacity building and Training, Determination of monitoring parameters)**

✓**Construction of regional air monitoring network system**

Conclusion

❑ Conclusion

✓ **Korea has been one of the fastest growing economies in the world since the 1960s. The high growth rate in economy has resulted in the accelerated industrialization and the urbanization. The seven largest cities (Seoul, Busan, Daegu, Incheon, Gwangju, Daejeon and Ulsan) in Korea account for almost half the population. The vehicles emissions were the primary cause of air pollution in many urban areas.**

✓**The MOE and local government have carried out 10 air pollution monitorings with different objectives. The monitoring results for almost 10 years indicated that the Korean environmental policies to improve the air quality has contributed the reducing of the levels of SO_2 and CO. However, NO_2 and O_3 was still remained to resolve in present and future.**

✓**Recently, transboundary pollution through air has been highlighted as a major problem. Therefore, the cooperation among countries is necessary to preserve the marine and coastal environment in NOWPAP region. We should share the data and information with good qualities. For this purpose, we will have to prepare the regional air monitoring strategies.**

Annex(s): National polices and Legislations

❑ National polices and Legislations

✓ **Enforcement of the total maximum loading system of pollutants: Korea sets up the emission allowance standard to control vehicle-generated air pollutants. The system plans to cut 50-70% of the pollutant emission volume from factories, power plants and vehicles by 2012. Preparation for low-emission vehicle adoption: First of all, introduction of low-emission vehicles will be made mandatory in the city. Buses and garbage trucks will also be replaced with CNG or LPG buses and trucks. In addition, freight trucks and other diesel-powered vehicles will have to attach particulate filters and those that do not meet the emission standard will be banned from operation.**

✓**Enforcement of energy and fuel policies to improve air quality: Taking into account its air pollution reduction effect, the energy pricing system will be augmented to be more environment-friendly.**

✓**Korean environmental conservation and international cooperation**

Appendix IV

National Report of the Russian Federation on Atmospheric Deposition of Contaminants

By National Expert of Russia

NOWPAP POMRAC
WG1 Meeting
Vladivostok, Russia, 10-11 October 2005

National Report of the Russian Federation

Materials for this report were provided by:

- Primorsky Territorial Office on Hydrometeorology and Environmental Monitoring
- Far Eastern Regional Hydrometeorological Research Institute (FERHRI)
- Pacific Geographical Institute (PGI)
- Pacific Oceanological Institute (POI)

Atmospheric deposition (AD) of contaminants

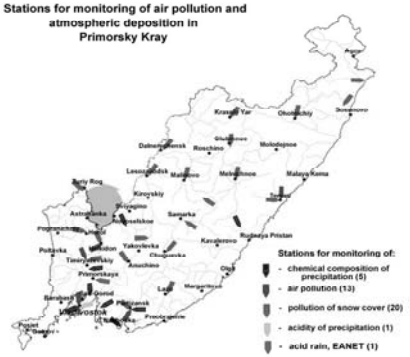
- Introduction
- National network
- Monitoring program and methods
- Monitoring results (examples)
- Research activities
- Training activities
- National priorities
- Proposed regional activities

AD - Introduction

Federal Service of Russia on Hydrometeorology and Environmental Monitoring (ROSHYDROMET) is responsible for routine monitoring. In Primorsky Kray, monitoring of contamination of air, inland waters, soil and marine environment is implemented by Primorsky Territorial Office on Hydrometeorology and Environmental Monitoring.

Research activities are carried out by Institutes of the Far East Branch of the Russian Academy of Sciences (FEBRAS) and other scientific organizations.

AD – National network (1)



AD – National network (2)

Number of stations for monitoring of:

- **chemical composition of precipitation - 5**
- **air pollution - 13 (in 8 cities)**
- **pollution of snow cover - 20**
- **acidity of precipitation - 1**
- **acid rain (EANET*) - 1**

*EANET = Acid Deposition Monitoring Network in East Asia

AD – Monitoring program (1)

Measurements are being done:

- **precipitation composition – once a month**
- **air pollution – three times a day**
- **snow cover composition – once a winter**
- **precipitation acidity – every rain event**
- **EANET, dry deposition – every two weeks**
- **EANET, wet deposition – every rain event**

Unfortunately, due to lack of government funding, number of monitoring stations has decreased (e.g., precipitation and snow cover monitoring stations – from 36 in 1990 to 26 in 2003, air pollution monitoring stations – from 15 to 13).

AD – Monitoring program (2)

Air pollution

Components	Methods
NH_3, NO, NO_2, SO_2, H_2S, Formaldehyde	Spectrophotometry
Fe, Cd, Co, Mn, Cu, Ni, Pb, Cr, Zn	Atomic Absorption Spectrometry
CO	Electrochemical
Suspended solids (SS)	Gravimetric
SO_4	Nephelometric
Benz(a)pyrene	Luminescence

AD – Monitoring program (3)

Precipitation and snow cover composition

Components	Methods
NO_3, NH_4	Spectrophotometry
Na, K, Ca, Mg	Flame spectrophotometry
pH	Potentiometric
Conductivity	Conductometer
SO_4	Nephelometric
Cl, HCO_3	Potentiometric titration

AD – Monitoring program (4)

EANET

Components	Methods
Wet deposition (the same parameters as for precipitation)	The same methods as for precipitation composition
Dry deposition (NH_4, NO_3, SO_4, Cl, K, Na, Ca, Mg)	**Ion chromatography** (analysis is performed in Irkutsk)

AD – Monitoring results/examples (1)

- According to 2002 data, air in Primorsky Kray is mostly contaminated by NO_2 and benz(a)pyrene
- The highest NO_2 levels were registered in Vladivostok, Spassk and Ussuriysk (up to 0.08 ng/m^3 or 2 times higher than MPC*)
- The highest B(a)P contents were measured in Partizansk, Ussuriysk and Vladivostok (up to 4.5 ng/m^3 or 4.5 times higher than MPC*)

*MPC = Maximum Permissible Concentration

AD – Monitoring results/examples (2)

Composition of precipitation (mg/m^3), 2002

Period	Prec., mm	pH	Cl^-	Na^+	K^+	Ca^{++}	Mg^{++}
			Terney				
V-X	758	5.5	1.8	0.9	0.7	0.3	0.1
XI-IV	185	5.9	1.2	0.7	0.3	0.9	0.2
			Khalkidon				
V-X	656	6.2	2.5	0.9	0.3	2.4	0.7
XI-IV	130	6.2	3.0	1.4	0.8	4.4	0.5

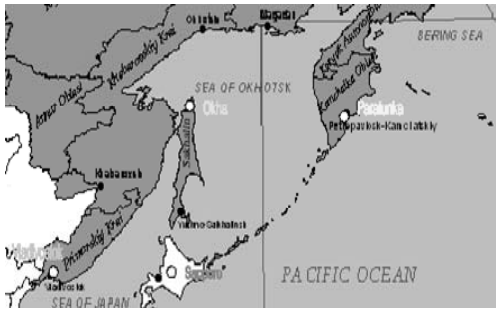
AD – Monitoring results/examples (3)

Atmospheric deposition (g/m^2), 2002

Period	Prec., mm	SO_4^{--}	NO_3^-	NH_4^+	Zn^+	Sum of ions
			Terney			
V-X	758	1.89	0.30	0.38	0.15	6.25
XI-IV	185	0.56	0.07	0.07	0.02	1.54
			Khalkidon			
V-X	656	4.59	0.46	0.39	0.07	12.78
XI-IV	130	1.60	0.06	0.10	0.03	3.32

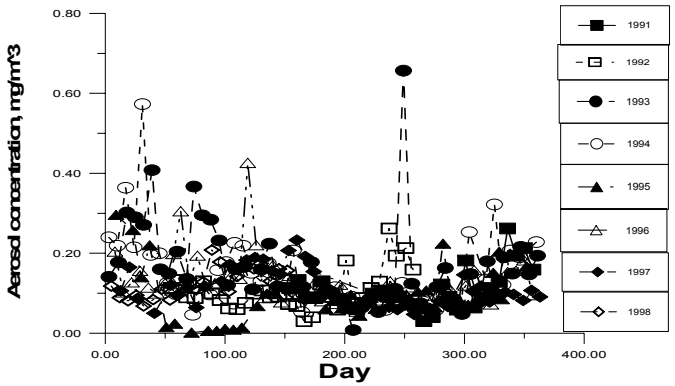
AD – Research activities (1)

Specialists from the Pacific Oceanological Institute (POI) carry out investigations of aerosol composition and atmospheric deposition over the Russian Far East (in collaboration with Japanese researchers)



AD – Research activities (2)

Some episodic events are caused by dust storms



AD – Research activities (3)

Contaminant inputs (%) to Ussuriysky bay (Mishukov, 1999)

Element	Rivers	Wastewaters	Atmosphere
Zn	25	25	50
Pb	28	35	38
Cu	22	44	34
Cd	5	39	55
Mn	55	2	43
SS	56	6	38

AD – Training activities

- Training of specialists of Primorsky Hydrometeorological Service is carried our in Moscow and Saint-Petersburg, at ROSHYDROMET central institutions
- Depending on funds availability, training of specialists from China, Japan and Korea can be also organized

AD – National priorities

- Re-establish the monitoring station in the Sikhote-Alin Biosphere Reserve
- Increase number of monitoring stations
- Increase number of measured parameters (e.g., trace metals, petroleum hydrocarbons)

AD – Proposed regional activities

- Harmonize monitoring methods and air quality criteria among NOWPAP countries
- Publish National Reports with detailed information on methods and results for e.g. 2002
- Organize intercomparison exercise on precipitation composition (e.g., nutrients and trace metals)

NOWPAP POMRAC

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Report of 2nd Meeting of NOWPAP Working Group 2

- River and Direct Inputs of Contaminants into the Marine and Coastal Environment

POMRAC, Vladivostok, Russian Federation

10-11 October 2005

UNEP/NOWPAP/POMRAC/WG2 2/7

Report of the 2nd Meeting of NOWPAP Working Group 2 - River and Direct Inputs of Contaminants into the Marine and Coastal Environment

(Vladivostok, Russian Federation, 10-11 October 2005)

Background leading to this meeting

The Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (NOWPAP) and three Resolutions were adopted at the First Intergovernmental Meeting (Seoul, Republic of Korea, 14 September 1994: UNEP(OCA)/NOWPAP/IG.1/5). Resolution 1 identified five areas of priority for implementation of the Action Plan, one of which was NOWPAP/3: Establishment of a collaborative, regional monitoring programme.

Following the decision of the 3rd NOWPAP Intergovernmental Meeting, the responsibility for NOWPAP/3 (Regional Monitoring Programme) was jointly shared by the Special Monitoring and Coastal Environmental Assessment Regional Activity Center (CEARAC) and the Pollution Monitoring Regional Activity Center (POMRAC) to carry out regional activities.

Following the results of discussions at the First NOWPAP/3 Meeting (Beijing, China, 21-22 May 2001), the 7th NOWPAP Intergovernmental Meeting (Vladivostok, 20-22 March 2002) approved the resolution 3 Para.6, "the demarcation of the responsibilities and activities between CEARAC and POMRAC as presented by the secretariat in document UNEP/NOWPAP IG.7/8". Subsequently POMRAC was allocated with the responsibility to implement activities related to Working Group (WG) 1 - Atmospheric Deposition and WG 2 - River and Direct Inputs.

The 1st Focal Points Meeting of POMRAC (Vladivostok, Russia, 9-11 April 2003) decided that the main task of WG 1 and WG 2 should be to establish regional assessment programs to evaluate the - i) atmospheric deposition of contaminants; and ii) river and direct inputs of contaminants into the marine and coastal environment in NOWPAP region, respectively.

The 1st Focal Points Meeting of POMRAC also decided that the main objectives of WG 1 and WG 2 (respectively) would be:

a) Exchange information to ensure practical implementation of activities related to the monitoring of atmospheric deposition / river and direct inputs in the NOWPAP region.
b) Promote, coordinate and harmonize regional cooperation in the NOWPAP region related to the monitoring of atmospheric deposition / river and direct inputs into the coastal and marine environment.

The 1st Joint Meeting of NOWPAP POMRAC Working Groups (WG 1 and WG 2) was organized by POMRAC on 24-25 May 2004 in Vladivostok, the Russian Federation. The Meeting reviewed Structures and Contents of National Reports of NOWPAP Members for WG 1 and WG 2 and discussed the procedure of preparing the National Reports.

The 2nd Focal Points Meeting of POMRAC (Vladivostok, Russia, 26-27 May 2004) adopted the procedure for the compilation and preparation of National Reports for WG 1 and WG 2. It was adopted that the National Reports will be prepared by either the POMRAC Focal Points

assisted by National Experts, or directly by National Experts hired by POMRAC. Financial support for the preparation of the National Reports will be provided by POMRAC, according to guidance of POMRAC FPs. It was decided that for unification of the data from NOWPAP Members samples of some tables and lists of recommended parameters will be submitted by POMRAC Secretariat after its approval by National Focal Points.

The 2nd Meeting of NOWPAP Working Group 2 has reviewed the National Reports, prepared by NOWPAP Members, provided recommendations on their harmonization and publishing, discussed and adopted Structure of the Regional Overview for WG 2, which should be adopted at the Third NOWPAP POMRAC Focal Points Meeting, discussed and adopted the establishment of the Reference Database for WG 2.

The representatives of NOWPAP Members, China, Japan, Korea and Russia participated in the Second Meeting of NOWPAP Working Group 2, which was organized by POMRAC and took place in Vladivostok, Russian Federation, 10-11 October 2005. The representative of NOWPAP RCU Toyama Office also participated in the meeting. The representatives of Special Monitoring & Costal Environmental Assessment Regional Activity Centre (CEARAC), participated in the meeting as observers. A full list of participants is **Annex 1** attached to the present report.

Agenda Item 1. Opening of the Meeting

1. The 2nd Joint Meeting of NOWPAP POMRAC Working Groups: WG 1 and WG 2 was opened at 9:15 am at the Conference Room of the Pacific Geographical Institute FEB RAS, Vladivostok, Russian Federation, on the 10th of October 2005 by the Director of POMRAC, Mr. Anatoly KACHUR. He welcomed all the participants of the meeting.

2. Director of POMRAC, Mr. Anatoly KACHUR, noticed that considering the necessity of discussing planned questions for each WG separately, it is proposed to separate proceedings of the both WGs and, as a consequence, to prepare particular documents and to adopt particular Reports of the Working Group Meetings. The separate activities of WG 2 (River and Direct Inputs) was held at the Library of the Pacific Geographical Institute FEB RAS.

Agenda Item 2. Organization of the Meeting

3. The meeting elected Dr. Vladimir SHULKIN as the Chairperson and Dr. Akira HARASHIMA as the Rapporteur for the Second Meeting of Working Group 2 (River and Direct Inputs) what corresponds with the rotational basis. Dr. SHULKIN was invited to give an opening statement and he expressed the importance of ongoing meeting for the finalization of National Reports and discussion of future activities.

4. Rules of procedure were established. It was proposed that, for purposes of the meeting, the rules used here should be those of the Governing Council of UNEP, adjusted as appropriate to suit the nature of the meeting.

5. POMRAC Secretariat introduced a suggested programme of work and timetable of the meeting.

6. English was the working language of the meeting. The secretariat presented a provisional list of the documents (Annex 2).

Agenda Item 3. Adoption of the Agenda

7. The Provisional Agenda (Annex 3) and the Timetable (Annex 3.1) were introduced by the Secretariat with the Annotated Provisional Agenda (NOWPAP/POMRAC/WG2 2/2).

8. The agenda was adopted without any changes.

Agenda Item 4. Overview of National Reports, prepared by National Experts of WG2[1]

9. National Experts from China, Japan, Korea and Russia have presented their National Reports on River and Direct Inputs of Contaminants into the Marine and Coastal Environment. Dr. Takeshi NAKATSUKA has presented the report of Japan. Prof. Yibing SU made a presentation of the National Report of China. Dr. Jae Ryoung OH has made his presentation of the National Report of the Republic of Korea though printed report was presented on October, 11. Dr. Vladimir SHULKIN has presented the National Report of Russia.

Agenda Item 5. Discussing recommendations on harmonization and publishing of National Reports of WG 2

10. POMRAC Secretariat has presented brief content analysis of the National Reports for WG 2 **(Annex 4)** and noted their correspondence to the structure admitted at the 2nd FPM, tables and recommended parameters prepared by POMRAC during the intersectional period. POMRAC secretariat has suggested recommendations on harmonization of Chinese, Japanese and Russian National Reports. Meeting has discussed the recommendations, given as notes to table 1 (Annex 4), and decided on the following:

- Notes 1,4,8,11,16 should be excluded.
- Notes 2,3,5,17 will be considered by the National Experts while finalization of the National Reports.
- Notes 6,7,9,10,12,13,14,15 will be considered, if it is possible, by the National Experts during the National Reports finalization.

Recommendation of POMRAC Secretariat on harmonization of National Report of Republic of Korea will be done later through the National Focal Point of Republic of Korea.

11. The Meeting has decided that harmonization of the National Reports will be conducted by the following National Experts:
- Japanese National Report by Dr. Takeshi Nakatsuka;
- Chinese National Report by Ms. Mingcui Wang and Prof. Yibing Su;
- Korean National Report by Dr. Jae Ryoung Oh;
- Russian National Report by National Expert appointed by the POMRAC secretariat.

The expenses for the harmonization procedure will be provided from POMRAC budget according to the rules of UNEP.

12. The Meeting has established that the end of November, 2005 will be deadline for the submitting of harmonized National Reports to the POMRAC Secretariat.

Agenda Item 6. Discussion of the Structure of the Regional Assessment/Overview for WG 2

13. POMRAC Secretariat has presented Draft of the Structure of the Regional Overview for the Meeting. After discussion, the meeting approved the suggested Structure (**Annex 5**) and agreed on the general volume of the Regional overview to be not more than 50 pages.

14. The Meeting has agreed that the Consultant for the Regional Overview preparation will be appointed and hired by POMRAC secretariat according to the rules of UNEP. The

[1] The summaries of presentations on National Reports are attached to this report as Appendixes.

procedure for the compilation and preparation of the Regional Overview suggested by POMRAC Secretariat was also discussed and approved.

Agenda Item 7. Discussion of the establishment of the Reference Database on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region (RDI Reference Database)

15. POMRAC Secretariat has proposed to establish RDI Reference Database and presented the Draft of the Structure of the Database for discussion (**Annex 6**).

16. The members of WG2 Meeting have discussed the proposal and agreed on the usefulness of establishing RDI Reference Database. The close cooperation with DINRAC is recommended for the proper implementation of this work. During the discussion, requirements for Reference Database filling were added (Annex 6). This concerned the list of categories of scientific papers and references presentation requirements.

List of the categories includes following:

a) National monitoring systems and the methodologies
b) Pollution status of estuarine and coastal zones
c) River inputs of contaminants
d) Direct inputs of contaminants

Each reference should contain the following (in English):

a) Author(s)
b) Title of publication
c) Journal/monograph
d) Year of publication
e) Language of publication
f) E-mail or postal address of author (s) or URL of website (*if possible)*
g) Location of study area
h) Period of observation
i) Key words

17. The Meeting agreed to recommend the 3rd POMRAC FPM to approve this activity and ask POMRAC Secretariat to communicate with DINRAC in October 2005 for discussing possibility of joint work for establishing RDI Reference Database.

Agenda Item 8. Discussion of the WG 2 workplan for the end of 2005 and 2006-2007

18. POMRAC Secretariat has presented the Report of WG 2 Intersessional Activity **(Annex 4)** and the Draft of the WG 2 Workplan for the end of 2005 and 2006-2007.

19. The meeting has discussed the workplan for 2006-2007. The deadline for the submission of finalized National Report should be end of November 2005. Also it was decided to prolong finalization of the Regional Overview from April to July, 2006. Also the Meeting decided that the Fourth Meeting of NOWPAP Working Group 2, which is planned to be held in April, 2007, will be organized depending on POMRAC budget and topics to be discussed (**Annex 7**).

20. National Expert of Korea, Dr. OH Jae Ryoung, suggested that it would be fruitful to organize POMRAC and DINRAC joint meeting to coordinate work for RDI Reference Database. The Meeting has agreed on the suggestion.

Agenda Item 9. Arrangement date and venue of the Third Meeting of NOWPAP POMRAC Working Group 2 (RDI)

21. The Meeting agreed on the POMRAC secretariat suggestion on time separation of the Working Groups Meetings and Focal Points Meeting because conducting the Meetings "back-to-back" makes the document preparation very difficult. It was decided that the Third Meeting of Working Group 2 will be held in April, 2006. According to the preliminary discussion of POMRAC Secretariat with Chinese FP Dr. Ruibin WANG, one of the Chinese cities could be a suitable and convenient place for the arrangement of Third Meeting of WG2. The Members of WG2 Meeting agreed on such suggestion.

22. The Third Meeting of Working Group 2 will consider following items:
- to review Regional Overview for WG 2;
- to review the establishment of RDI Reference Database;
- to review plans for future work.

Agenda Item 10. Other Matters

23. The meeting was invited to raise any other issues relevant to Working Group 2 activities. No comments were made.

Agenda Item 11. Adoption of the report of the meeting

24. A draft report of the meeting was prepared by the Rapporteur and the Secretariat for consideration and adoption. The report was finally adopted.

Agenda Item 12. Closure of the Meeting

25. The meeting was closed on 11th of October, 2005 at 18:15 by the Chairperson.

Participants of the 2nd Meeting of NOWPAP Working Group 2
(Vladivostok, Russian Federation, 10-11 October, 2005)

Annex

Annex content

Annex 1

List of participants of the 2nd Meeting of NOWPAP Working Group 2

Annex 1

List of participants of the 2nd Meeting of NOWPAP Working Group 2

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Annex 2

List of documents
for the 2nd Meeting of NOWPAP Working Group 2

Annex 2

List of documents for the 2nd Meeting of NOWPAP Working Group 2

Timetable Provisional Agenda	UNEP/NOWPAP/POMRAC/WG 2 2/1
Annotated Provisional Agenda	UNEP/NOWPAP/POMRAC/WG 2 2/2
Report of NOWPAP WG 2 (River and Direct Inputs) Intercessional Activity	UNEP/NOWPAP/POMRAC/WG 2 2/3
DRAFT Structure and Content of Regional Overview on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region	UNEP/NOWPAP/POMRAC/WG 2 2/4
Reference Database on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region (RDI Reference Database)	UNEP/NOWPAP/POMRAC/WG 2 2/5
DRAFT Working Group 2 Workplan for the end of 2005 and 2006/2007	UNEP/NOWPAP/POMRAC/WG 2 2/6
Provisional list of participants	UNEP/NOWPAP/POMRAC/WG 2 2/Inf. 1

NATIONAL REPORTS

National Report of Japan on River and Direct Inputs of Contaminants Into the Marine and Coastal Environment in the NOWPAP Region

National Report of China on River and Direct Inputs of Contaminants Into the Marine and Coastal Environment in the NOWPAP Region (DRAFT)

Draft National Report of the Russian Federation on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in the NOWPAP Region

Annex 3

Provisional Agenda

Annex 3

Provisional Agenda

Day 1 (October 10, 2005)

5. Opening of the meeting (together with WG1)
6. Organization of the meeting
   Election of the officers
   Organization of work
7. Adoption of the Agenda
8. Overview of National Reports, prepared by National Experts of WG 2
   4.1. Report of the Japanese National Expert
   4.2. Report of the Chinese National Expert
   4.3. Report of the Korean National Expert
   4.4. Report of the Russian National Expert
5. Discussion of recommendations for harmonization and publishing of National Reports of WG2
13. Discussion of the Structure of the Regional Assessment/Overview for WG 2

Day 2 (October 11, 2005)

14. Discussion of the establishment of the Reference Database on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region (RDI Reference Database)
15. Discussion of the WG 2 workplan for 2006
16. Arrangement date and venue of the Third Meeting of NOWPAP POMRAC Working Group 2 (RDI)
17. Other matters
18. Adoption of the report of the meeting
19. Closure of the meeting

Annex 3.1

Timetable

Annex 3.1

Timetable

Day 1 (10 October 2005)

9:00 – 9:15 Registration

9:15 – 9:30 Agenda Item 1. Opening of the Meeting

9:30 – 9:40 Agenda Item 2. Organization of the Meeting

9:40 – 9:50 Agenda Item 3. Adoption of the Agenda

9:50 – 12:20 Agenda Item 4. Overview of National Reports, prepared by National Experts of WG2

9:50 – 10:20 4.1. Report of the Japanese National Expert

10:20 – 10:50 4.2. Report of the Chinese National Expert

10:50 – 11:20 (Coffee Break) (Group Photograph)

11:20 – 11:50 4.3. Report of the Korean National Expert

11:50 – 12:20 4.4. Report of the Russian National Expert

12:20 – 14:00 Lunch Break

14:00 – 15:30 Agenda Item 5. Discussion of recommendations for harmonization and publishing of National Reports of WG2

15:30 – 17:00 Agenda Item 6. Discussion of the Structure of the Regional Assessment/Overview for WG 2

Day 2 (11 October 2005)

9:00 – 10:20 Agenda Item 7. Discussion of the establishment of the Reference Database on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region (RDI Reference Database)

10:20 – 10:40 (Coffee Break)

10:40 – 12:00 Agenda Item 8. Discussion of the WG 2 workplan for 2006

12:00 – 12:20 Agenda Item 9. Arrangement date and venue of the Third Meeting of NOWPAP POMRAC Working Group 2 (RDI)

12:20 – 12:30 Agenda Item 10. Other Matters

12:30 – 16:00 Lunch Break
Preparation of the meeting report by the Secretariat

16:00 – 17:30 Agenda Item 11. Adoption of the report of the meeting

17:30 Agenda Item 12. Closure of the Meeting

Annex 4

Report of NOWPAP WG 2 (River and Direct Inputs) Intercessional Activity

Annex 4

Report of NOWPAP WG 2 (River and Direct Inputs) Intercessional Activity

According to Terms of Reference for WG 2, adopted by the 2nd NOWPAP POMRAC FPM (26-27 May, 2004) the main objectives of WG 2 are:

(e) Exchange information to ensure practical implementation of activities related to the monitoring of river and direct inputs in the NOWPAP region.
(f) Promote, coordinate and harmonize regional cooperation in the NOWPAP region related to the monitoring of river and direct inputs into the coastal and marine environment.

According to the workplan for POMRAC in 2004/2005 (UNEP/NOWPAP/POMRAC/FPM 2/7) the preparation of the National Reports of WG 2 was the main activity during the intercessional period.

Fulfilling the activity included the following:
5. Development of Structure of the National Reports
6. Development of Sample Tables for the National Reports
7. Signing contracts with National Experts, appointed by Focal Points
8. Technical testing of conformity of the Reports with the established structure

Detailed description of the stages is given below.

1. Development of Structure of National Reports

The Structure of National Reports was discussed and approved in the 2nd NOWPAP POMRAC FPM ((UNEP/NOWPAP/POMRAC/FPM 2/7, Annex 8).

4. Development of Sample Tables for the National Reports

Sample Tables for the National Reports were prepared by POMRAC Secretariat in July 2004 and distributed among POMRAC Focal Points for harmonization. The tables are given below.

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Table 2.1.* Geographical characteristics of the main territorial objects (river basins, provinces or regions)

Territorial object (river basin, province or region)	Square, km^2	Length of main coastal line**, km
Object 1		
Object 2		
…		
Total		

* *Number of the table corresponds to the number of chapter of the report.
** - without coastal line of small islands

Table 3.1. Population density and annual income of the main territorial objects to the NOWPAP area

Territorial object (river basin, province or region)	Population	Population density	Percentage of rural population	GDP* per capita, USD/person
Object 1				
Object 2				
…				
Total				

* GDP – Gross domestic product

Table 4.3.1. Structure of monitoring network, content and frequency of observations

Water Type	Quantity of stations	Content of observations	Frequency
Ambient waters (river and lake)	20	Hydrological parameters, tºC, conductivity, DO, pH, SS, BOD,COD, N-NH_4, NO_2, NO_3, PO_4, $Si(OH)_4$ **plus** all characteristic pollutants	monthly
	13	Above mentioned **plus** trace metals, PAH, POPs, oil products, main ions composition, and description of plankton and benthos communities	Main hydrological stages(quarterly)
Wastewaters			

Note: The content of the table is for example, only

Table 4.3.2. Preservation and Analysis methods used (surface water quality)

Parameters	Preservation Method	Analysis Method	Measurement range and accuracy
Suspended solids (SS)	Store at 4ºC	Gravimetric after filtration	0.2-2000 mg/l
SO_4	-	Nephelometric	
Color	Store at 4ºC	Spectrophotometry	
Anionic surfactants	Store at 4ºC		
Phenols	Add hexane 1ml/l		
NO_2			
NH_4			
PO_4			
Si			
As			
B			
Fe_{Total}			
Cr_{Total}			
Al			
Mo			
Cr^{6+}			
NO_3		Potentiometric	
F			
pH			
O_2		Titration	
Cl			
Ca, Mg			
HCO_3			
COD			
BOD_5			
Petroleum Hydrocarbons		Infrared spectrophotometry	
POP (HCH isomers)		Gas chromatography	
POP (DDT isomers)			
Na		Flame spectrophotometry	
K			

Parameters	Preservation Method	Analysis Method	Measurement range and accuracy
Trace metals	Add c-HNO_3 2 ml/l	Atomic Absorption Spectrophotometry or Anodic Stripping Voltamperometry	

Note: The content of the table (parameters etc.) is for example, only.

Table 5.1. Chemical composition of rivers flowing into the sea (average for 2002)

Rivers	Water discharge (m^3/s)	SS (mg/l)	BOD_5 (mg/l)	COD (mg/l)	Si (mg/l)	NH_4 (mg/l)
MPC						
Rivers	**NO_2 (mg/l)**	**NO_3 (mg/l)**	**PO_4 (mg/l)**	**PHC (mg/l)**	**∑DDT (μg/l)**	**∑HCH (μg/l)**
MPC						
Rivers	**Phenols (mg/l)**	**Pb dis (μg/l)**	**Cu dis (μg/l)**	**Mn diss (μg/l)**	**Fe diss (μg/l)**	**Fe_{Tot} (mg/l)**
MPC						
Rivers	**Cd diss (μg/l)**	**Zn diss (μg/l)**	**DO mg/l**	*other substances*	**…**	**…**
MPC						

Notes: **SS** - suspended solids; **DO** – dissolved oxygen; All **nutrients** in filtered samples; **Me diss** – concentration of dissolved metal forms in filtered samples; **Fe tot** – concentration of all acid released Fe from unfiltered samples; **PHC** - petroleum hydrocarbons; **∑DDT** - sum of DDT and its metabolites (DDD and DDE); **∑HCH** - sum of HCH isomers (α, β and (). MPC = maximum permissible concentration.

Table 5.2. Annual discharge of some nutrients, petroleum and chlorinated hydrocarbons (tons) with rivers into the sea (average for 2002)

River (or river basin, province or region)	PO4	NO2	NO3	NH4	Si	OM	PHC	(DDT	**∑HCH**	*other substances*	**…**
Object 1											
Object 2											
…											
Total											

Note: OM – dissolved and suspended organic matter assessed by COD (and/or BOD) values, **PHC** - petroleum hydrocarbons; **∑DDT** - sum of DDT and its metabolites (DDD and DDE); **∑HCH** - sum of HCH isomers (α, β and γ)

Table 5.3. Annual discharge of some dissolved metals (tons) with rivers into the sea (average for 2002)

River (or river basin, province or region)	**Pb**	**Cd**	**Fe**	**Mn**	**Cu**	**Zn**	**Ni**	*other substances*	**…**
Object 1									
Object 2									
…									
Total									

Table 5.4. Annual discharge of SS and particulate metals (tons) with rivers into the sea (average for 2002)

River (or river basin, province or region)	SS	Pb	Cd	Fe	Mn	Cu	Zn	Ni	*other substances*	…
Object 1										
Object 2										
…										
Total										

Note: Assessments in Tables 5.2 – 5.4 are from multiplication of concentrations and water discharge from Table 5.1; **SS** - suspended solids.

Table 5.5. The annual load of effluents (wastewaters) (tons) to the coastal water (average for 2002)

River basin, province or region	PO_4	NH_4	OM	PHC	∑DDT	∑HCH	Pb	Cd	Fe	Ni	*other substances*	…
Object 1												
Object 2												
…												
Total												

Note: The table could be divided on two or three ones depending on number of parameters.

5. Signing contracts with National Experts, appointed by Focal Points

In July-August 2004 POMRAC Secretariat prepared the blank of *Memorandum of Understanding for preparation of National Report by the National Experts* and *Terms of Reference for preparation of National Report*. Owing to peculiarities of Russian banking system, transfer of money to Experts' accounts for report preparation was impossible from Russia. In the beginning of 2005, NOWPAP RCU Office supported the POMRAC proposal referring to the transfer of money to the Experts immediately by RCU. Memorandums of Understanding for preparation of National Reports were signed by the National Experts in March-May 2005. In July-September 2005 National Experts sent National Reports to POMRAC Secretariat. National Report of the Republic of Korea was presented only during the meeting.

List of the National Experts who prepared the National Reports is given below.

List of the National Experts

Mr. Tetsuro Mita
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4. Technical testing of conformity of the Reports with the established structure

POMRAC Secretariat has conducted the technical testing of conformity of the National Reports of three countries – Japan, China and Russia – in accordance with the established structure. The results are given in the table 1.

Analysis of report composition conformity with the structure established by the 2nd NOWPAP POMRAC FPM (UNEP/NOWPAP/POMRAC/ FPM 2/7, Annex 8) has indicated that the compilers followed the structure in bulk. But there are several deviations from the established structure. The Secretariat commentaries relating presented National Reports are in Notes to table 1.

Table 1
Analysis of report composition conformity for WG 2 (River and Direct Inputs), with the structure established by the 2nd NOWPAP POMRAC FPM

Structure and Content of National Reports of NOWPAP Members on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region (as adopted at the 2nd NOWPAP POMRAC FPM)	**Japan**	**China**	**Korea**	**Russia**
1. Executive Summary	1 page	0.2 page	The Report has not been presented by 10th of October 2005	1 page
2. Introduction	12 pages	5 pages		4 pages
▪ Goals and objectives of this report	+	+		+
▪ General background information on NOWPAP (set the report in the context of NOWPAP, short history, decisions)	+	+		+
▪ General information/introduction on river and direct inputs of contaminants (what is it, why is it important, relevance to the region etc.)	+	+		+
Geographical scope of relevant region of NOWPAP area (geographical coverage of the report, major rivers, coasts, mountains, cities, climatic systems, physical geography etc.)	+	+		+
Table 2.1. Geographical characteristics of the main territorial objects (river basins, provinces or regions)	+ [1]	+		+ (table 3.1)
▪ Institutional arrangements for developing these	+	+		

[1] Paragraph 2.4 “Geographical Outline of the NOWPAP Region” includes table 2-3 “Summary of River Basin Characteristics”. Data of the table summarize information on river length, area of river basins, quantity of populated localities and number of inhabitants, industry in each river basin. Possibly it makes sense to prepare analogous tables for other countries.

Table 2-3 of the National Report of Japan includes following:

River name	Length of trunk river route (km)	Basin area(km^2)	Included number of municipalities	Population (1,000)	Major industry	Amount of industrial shipment (hundred million yen)

Structure and Content of National Reports of NOWPAP Members on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region (as adopted at the 2nd NOWPAP POMRAC FPM)	**Japan**	**China**	**Korea**	**Russia**
reports (who prepared this report				
3. Social and economic situation in 2001-2002 (including the historical review for the last decade; Short overview of relevant social and economic aspects related to river and direct inputs of contaminants. e.g. population, distribution of communities, anthropogenic activities which cause river and direct inputs of contaminants, transport, energy, industry)	7 pages	1.5 pages		1.5 pages[1]
Table 3.1. Population density and annual income of the main territorial objects to the NOWPAP area	+	+		+
4. National monitoring and assessment activities (related to river and direct inputs of contaminants)	26 pages	5.5 pages		13 pages
4.1 Overviews of national policies and laws	+	- (NO DATA)[2]		+
4.2 National program(s) (major scientific or administrative programs, actors/organizations etc., institutional framework, regular or irregular activities/projects, and management program including standards.	+	+		+
4.3 Methodologies and procedures (including equipment used, detection limits and accuracy, QA/QC procedures. characteristics of network.	+	+		+
Table 4.3.1. Structure of monitoring network, content and frequency of observations	- (NO DATA)[3]	+[4]		+ (tables 4.4, 4.5)
Table 4.3.2. Preservation and Analysis methods used	+	+		+

[1] Two tables are presented: Table 3.1 "Social-economical characteristics of the coastal regions of Russian sector of NOWPAP area", and Table 3.2. "Individual indices for the Russian sector of the NOWPAP Region" with no commentaries. It is advisable to describe various types of anthropogenic activity (transport, energy and industry) influencing river and direct inputs of contaminants.

[2] No data. It is advisable to add to the information.

[3] No data. It is advisable to add to the information.

[4] Table 4.1 . "Structure of monitoring network, content and frequency of observations" specifies 571 stations. It may probably cover data concerning the entire China. It is advisable to present information for area belonging to NOWPAP Region.

Structure and Content of National Reports of NOWPAP Members on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region (as adopted at the 2nd NOWPAP POMRAC FPM)	**Japan**	**China**	**Korea**	**Russia**
(surface water quality)				(table 4.6)
4.4 Research activities	+	+		+
4.5 Training activities and programs	+	+		+
5. Present situation of river and direct inputs of contaminants (based on 2002 data) and long term trends, if available. Recommended parameters will be submitted by POMRAC secretariat.	9 pages	9 pages		8 pages
Table 5.1. Chemical composition of rivers flowing into the sea (average for 2002)	+[5]	+[6]		+[7]
Table 5.2. Annual discharge of some nutrients, petroleum and chlorinated hydrocarbons (tons) with rivers into the sea (average for 2002)	+[8]	- (NO DATA)[9]		+[10]
Table 5.3. Annual discharge of some dissolved metals (tons) with rivers into the sea (average for 2002)		- (NO DATA)[11]		+ (table 5.4)
Table 5.4. Annual discharge of SS and particulate metals (tons) with rivers into the sea (average for 2002)		- (NO DATA)[12]		+ (table 5.5)
Table 5.5. The annual load of effluents (wastewaters) (tons) to the coastal water (average for 2002)	+[13]	+[14]		+[15]

[5] Tables 5-1 and 5-2 include data on SS, BOD_5, COD, DO, NO2-N, NO3-N, Pb diss, Cd diss and other parameters, Unfortunately they do not cover information on NH_4, PO_4, PHC, Si, ΣDDT, ΣHCH, Phenols, Cu diss, Mn diss, Fe diss, Fe tot, Zn diss. It makes sense to make the supplements.

[6] Tables 5.2-5.9 present data on NH3-N, BOD5, COD, Hg, Pb, V-phen, Oils, but have no data concerning, Si, PO_4, ΣDDT, ΣHCH, DO, Cu diss, Mn diss, Fe diss, Fe tot, Zn diss. It is advisable to supplement the data.

[7] Tables 5.1-5.2 display information on all the parameters required except ΣDDT, ΣHCH, Fe tot. It is recommended to supplement the data.

[8] Table 5.3 includes data on SS, BOD_5, COD, NO2-N, NO3-N, Pb diss, Cd diss, though other recommended parameters are absent. It is required to supplement them.

[9] No data. It is advisable to add to the information.

[10] Tables 5.1-5.2 display information on all the parameters required except ΣDDT, ΣHCH. It is advisable to add to the information.

[11] No data. It is advisable to add to the information.

[12] No data. It is advisable to add to the information.

Structure and Content of National Reports of NOWPAP Members on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region (as adopted at the 2nd NOWPAP POMRAC FPM)	**Japan**	**China**	**Korea**	**Russia**
6. Proposals for future regional activities and priorities in NOWPAP regions	0,3 page	0,3 page		1 page
7. Conclusion	1 page	0,5 page		1 page
8. Data availability (publications, Websites and other information sources)	1 page	0,3 page		- (NO DATA)[16]

[13] Table 5.6 displays data on general discharge of waste water but not on peculiar pollutants (NH_4, PO_4, PHC, ΣDDT and others) It is advisable to add to the information.

[14] Table 5.10 displays data on general discharge of waste water but not on peculiar pollutants (NH_4, PO_4, PHC, ΣDDT and others). It is advisable to add to the information.

[15] Tables 5.7-5.8 display information on all the parameters required except ΣDDT, ΣHCH and metals. It is advisable to add to the information.

[16] No data. It is advisable to add to the information.

Annex 5

Structure and Content of Regional Overview on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region

Annex 5

Structure and content of Regional Overview on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region

1. Executive Summary

2. Introduction

- Goals and objectives of the Overview
- General background information on NOWPAP (set the Overview in the context of NOWPAP, short history, decisions)
- General information/introduction on river and direct inputs of contaminants (what is it, why is it important, relevance to the region etc.)
- Geographical scope of NOWPAP area (geographical coverage of the report, major rivers, coasts, mountains, cities, climatic systems, physical geography etc.)
- Sources for developing these reports

3. Social and economic situation in 2002 (including the historical review for the last decade; Short overview of relevant social and economic aspects related to river and direct inputs of contaminants. e.g. population, distribution of communities, anthropogenic activities which cause river and direct inputs of contaminants - transport, energy, industry)

4. Monitoring and assessment activities in NOWPAP Member Countries (related to river and direct inputs of contaminants)

4.1. Overviews of national and international policies and laws

4.2. National and international program(s) (major scientific or administrative programs, actors/organizations etc., institutional framework, regular or irregular activities/projects, and management program including standards.

4.3 Methodologies and procedures (including equipment used, detection limits and accuracy, QA/QC procedures, characteristics of national networks.

4.4 Research activities (national and international)

4.5 Training activities and programs

5. Present situation of river and direct inputs of contaminants (based on 2002 data) and long term trends, if available.

6. Proposals for future regional activities and priorities in NOWPAP regions

7. Conclusion

8. Data availability (publications, Websites and other information sources)

Procedure for the compilation and preparation of the Regional Overview on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region

The procedure may include the following stages:

1. The Regional Overview will be compiled on the basis of "Structure and Contents of Regional Overview" agreed upon by the 3rd NOWPAP POMRAC Focal Points Meeting. Different sources, and first of all National Reports of WG 2, may be used for compilation of the Regional Overview.

2. The Regional Overview will be prepared by consultant from any NOWPAP Member Countries. Financial support for the preparation of the Regional Overview will be provided by POMRAC, according to guidance of POMRAC FPs.

3. Draft Regional Overview will be submitted to POMRAC Secretariat by the consultant. POMRAC Secretariat will submit Draft Regional Overview to the WG2 and POMRAC Focal Points of each countries by e-mail. After receiving comments from WG2 and POMRAC FPs of each country (within 30 days), the overview will be amended by the consultant and submitted to the next POMRAC FPM for review and adoption.

4. The next POMRAC FPM will discuss and agree whether the Regional Overview is completed. When finalized, the Regional Overview will be printed as a POMRAC technical report.

Annex 6

Reference Database on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region (RDI Reference Database)

Annex 6

Reference Database on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in NOWPAP Region (RDI Reference Database)

Background

According to the Terms of Reference for WG 2, adopted by the 2nd NOWPAP POMRAC FPM (26-27 May, 2004) the main objectives of WG 2 are:

(g) To exchange information to ensure practical implementation of activities related to the monitoring of river and direct inputs in the NOWPAP region.
(h) To promote, coordinate and harmonize regional cooperation in the NOWPAP region related to the monitoring of river and direct inputs into the coastal and marine environment.

RDI Reference Database is established in accordance with POMRAC Secretariat proposal and approved at the Second Meeting of NOWPAP Working Group 2 for improving information exchange related to the monitoring of river and direct inputs of contaminants into the marine and coastal environment in NOWPAP region. It will comprise data on articles, scientific reports and databases concerning results of investigating current state of rivers, river basins and estuarial zones in NOWPAP region, methods for sustainable development of monitoring and nature management. Thus, the database will improve coordination and harmonization of regional cooperation in monitoring of river and direct inputs of contaminants into the marine and coastal environment in NOWPAP region.

Foundation of the RDI Reference Database project

POMRAC and DINRAC are supposed to collaborate in RDI Reference Database foundation. The basic function of Data and Information Network Regional Activity Center (DINRAC) is "… exchange information on marine and coastal environmental data and information management in the NOWPAP region…" (UNEP/NOWPAP/DINRAC/FPM 2/15, Annex 6). In the end of 2005, POMRAC Secretariat will offer DINRAC to collaborate in RDI Reference Database foundation. In case of agreement, the duties will be allotted as follows: POMRAC will provide for obtaining reference data and present the data to DINRAC; DINRAC, in consequence, will develop electronic database for its hosting in Internet. The database will be available through both POMRAC and DINRAC web-sites.

In case of DINRAC impossibility to participate in the project, POMRAC will discuss other variants for its realization.

To realize the project, POMRAC Secretariat suggests approving supplementary budget for **Establishment of RDI Reference Database** of US$ 2000, each National Expert of the four countries to be remunerated with US$ 500.
Updating the RDI Reference Database should be conducted biannually.

Filling RDI Reference Database

1. RDI Reference Database filling will be conducted by National Experts nominated by POMRAC Focal Points. Financial support for RDI Reference Database filling will be provided by POMRAC, according to guidance of POMRAC FPs.

2. National Experts will provide data for RDI Reference Database (not less than 100 references) considering following recommendations:

    - Each reference should be categorized into the following items:
        a) National Monitoring Systems and Methods of monitoring
        b) Contamination of estuarine and coastal zones
        c) River inputs of contaminants
        d) Direct inputs of contaminants

    - Each reference should contain the following:
        a) Author(s)
        b) Name of publication
        c) Journal/monograph
        d) Year of publishing
        e) Language of the publication
        f) e-mail or postal address of author (s) or website (*if possible)*
        g) Location of study area
        h) Key words

For example:

Country: Russia

Category: ***Contamination of estuarine and coastal zones***

1. Shulkin V.M. Pollution of the coastal bottom sediments at the Middle Primorie (Russia) due to mining activity //Environmental Pollution, 1998. V. 101. P. 401-404. *(In English)*

2. Anikiev V.V., Savelyeva N.I. Behavior of heavy metals in the processes of river and seawater mixing. Estimates of the influence of hydrodynamical processes of the spatial distribution of Fe, Mn, Zn and Cu in estuary of Razdolnaya River (Amur Bay) //Geochemistry, 1995. N 5. P. 576-587. *(In Russian)*

3. …

Annex 7

Working Group 2 Workplan for the end of 2005 and 2006/2007

Annex 7

Working Group 2 Workplan for the end of 2005 and 2006/2007

Activity	2005			2006											2007*											
	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
2. Harmonization and printing of the National Reports																											
a) Finalization of the National Reports by experts who compiled them following the 3rd POMRAC FPM recommendations	√	√																									
b) Signing contracts with consultants approved by the 3rd POMRAC FPM to harmonize the National Reports	√																										
c) Presenting finalized National Reports by appointed consultants and approving the Reports by the National Focal Points (via e-mail)		√	√																								
d) Printing of National Reports				√	√																						
2. Preparation of the Regional Overview																											
a) Signing contracts with consultants appointed by the 3rd POMRAC FPM	√																										
b) Draft Regional Overview presentation by the appointed consultants					√																						
c) POMRAC Secretariat will submit Draft Regional Overview to WG2 and POMRAC Focal Points by e-mail. After receiving comments from WG2 and POMRAC FPs (within 2 weeks), the overview will be revised by the consultant					√	√																					
d) Discussion of the Draft Regional Overview on the Third Meeting of NOWPAP WG 2							√																				

Activity	2005			2006												2007*											
	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
e) Finalization of the Regional Overview by the consultant considering recommendations by the 3rd Meeting of NOWPAP Working Group 1							√	√	√	√																	
f) Discussion and adoption the Regional Overview on the 4th NOWPAP POMRAC FPM****								√				√															
g) Printing of the Regional Overview											√	√	√	√													
3. Establishment of RDI Reference Database																											
a) Offering cooperation to DINRAC	√	√																									
b) Signing contracts with National Experts			√	√																							
c) Presentation of Categorized List of Reference by the National Experts						√																					
d) Discussion further development of RDI Reference Database on the Third Meeting of NOWPAP WG 2							√	√																			
e) Development of RDI Reference Database									√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
4. The Third Meeting of NOWPAP WG 2							√																				
5. The 4th NOWPAP POMRAC FPM ****								√				√															
6. The Fourth Meeting of NOWPAP WG 2* **																			√								
7. The 5th NOWPAP POMRAC FPM																				√							
8. Activity in a direction of integrated river watersheds and coastal zones management**																√	√	√	√	√	√	√	√	√	√	√	√

Notes:

* The workplan for 2007 will be developed and adopted by the 4th NOWPAP POMRAC FPM (May 2006) in accordance with decisions of the 10th Intergovernmental Meeting (November, 2005, Toyama, Japan).

** The detailed program of this activity will be discussed on the 4th NOWPAP POMRAC FPM (May 2006) after decision of the 10th Intergovernmental Meeting (November, 2005, Toyama, Japan) on change of NOWPAP RACs activity.

*** The Fourth Meeting of NOWPAP WG 2 will be organized if necessary.
**** The date of the 4th NOWPAP POMRAC FPM (May or September) will be defined during the 3rd FPM of POMRAC.

Appendix

Appendix contents

Appendix I

National Report of Japan
on River and Direct Inputs of Contaminants
into the Marine and Coastal Environment in the NOWPAP Region

By National Expert of Japan

Outline of National Report of Japan

On River and Direct Inputs of Contaminants
Into the Marine and Coastal Environment
in the NOWPAP Region

October, 2005
WG2 POMRAC Vladivostok RUSSIA

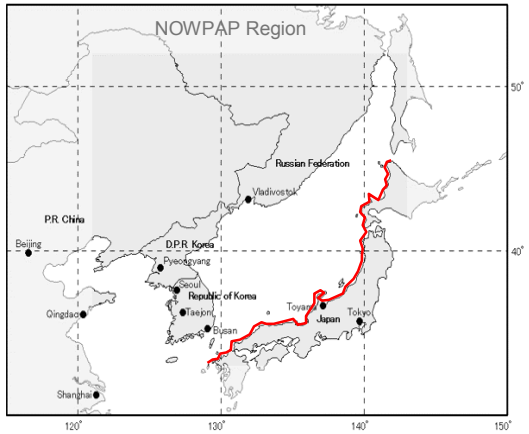
Table of Contents

1. Introduction

■ **Purpose of the Report**

This report introduces the national programs for evaluation of river and direct inputs of contaminants into the marine and coastal environment of the NOWPAP region, prepared by POMRAC WG2 of Japan.

■



Note: The red line shows the coastal zone of Japan

■ Geographical Outline of the NOWPAP Region

Total Area 182,841km^2
(47% of Japan's total area)

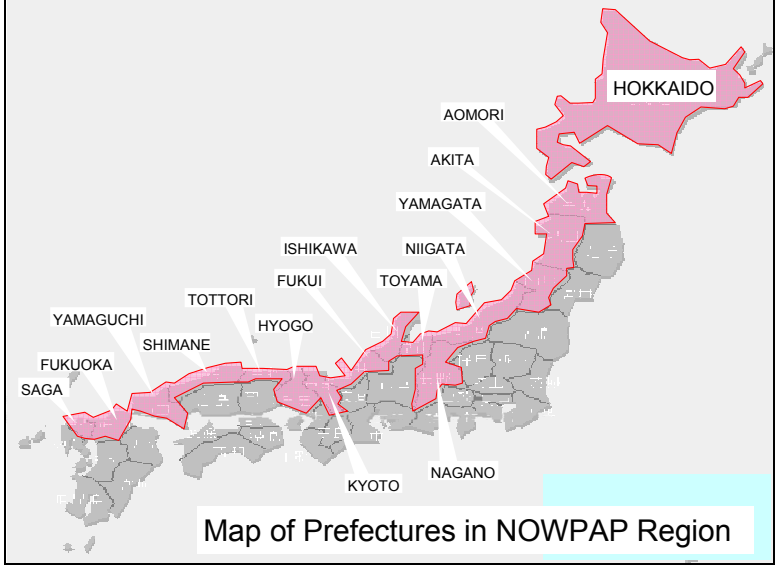
Residential area	5,126	(3%)
Rice field	12,781	(7%)
Farm land	12,558	(7%)
Forest and others	152,376	(83%)

■ Outline of Administration in the NOWPAP Region

There are 16 major prefectures within the basin areas that flow into the NOWPAP region in Japan. These prefectures are followings:

(1) Hokkaido	**(2) Aomori**	**(3) Akita**	**(4) Yamagata**
(5) Niigata	**(6) Toyama**	**(7) Ishikawa**	**(8) Fukui**
(9) Nagano	**(10) Kyoto**	**(11) Hyogo**	**(12) Tottori**
(13) Shimane	**(14) Yamaguchi**	**(15) Fukuoka**	**(16) Saga**

Note: There are other 5 prefectures within the basins, however these area do not contribute so much for the pollution load into the NOWPAP region.



Map of Prefectures in NOWPAP Region

■ Outline of Regional Area

Prefecture	Total area (km^2)	Total coastline (km)
Hokkaido	**83,454**	**4,377**
Aomori	**9,235**	**744**
Akita	**11,434**	**304**
Yamagata	**7,394**	**110**
Niigata	**10,939**	**585**
Toyama	**2,802**	**117**
Ishikawa	**4,185**	**581**
Fukui	**4,189**	**397**
Nagano	**12,598**	**0**
Kyoto	**4,613**	**310**
Hyogo	**8,393**	**784**
Tottori	**3,507**	**144**
Shimane	**6,707**	**814**
Yamaguchi	**6,111**	**1,398**
Fukuoka	**4,841**	**589**
Saga	**2,439**	**357**
Total	**182,841**	**11,610**

■ Outline of Major River

- **There are 35 major rivers* that flow into the NOWPAP region.**
- **The average flow rate are 4.7 ～ 475m³/s. (Data 1998)**
- **The Shinano River, Ishikari River, Mogami River and Agano River are particularly large rivers.**

***the major rivers are called "the first class rivers" in Japan. The Minister of Land, Infrastructure and Transport has given these rivers special designation because of their economic importance and their importance to land conservation.**

2. Social and Economic Situation in Recent Years

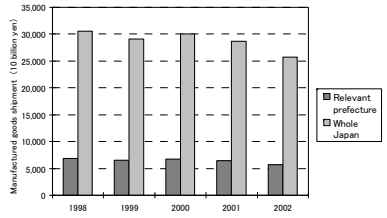
Population in the NOWPAP Region

Prefecture	1990	1995	2000	2002	Ratio to the whole country in 2002 (%)
■ Whole JAPAN	123,611	125,570	126,926	127,435	100
■ NOWPAP AREA total	34,019	34,248	34,405	34,383	26.98
Hokkaido	5,644	5,692	5,683	5,670	4.45
Aomori	1,483	1,482	1,476	1,469	1.15
Akita	1,227	1,214	1,189	1,176	0.92
Yamagata	1,258	1,257	1,244	1,235	0.97
Niigata	2,475	2,488	2,476	2,465	1.93
Toyama	1,120	1,123	1,121	1,119	0.88
Ishikawa	1,165	1,180	1,181	1,180	0.93
Fukui	824	827	829	828	0.65
Nagano	2,157	2,194	2,215	2,217	1.74
Kyoto	2,602	2,630	2,644	2,642	2.07
Hyogo	5,405	5,402	5,551	5,578	4.38
Tottori	616	615	613	612	0.48
Shimane	781	771	762	757	0.59
Yamaguchi	1,573	1,556	1,528	1,518	1.19
Fukuoka	4,811	4,933	5,016	5,043	3.96
Saga	878	884	877	874	0.69

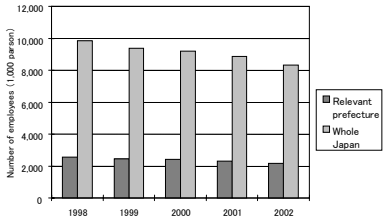
General Industrial Conditions

		Number of Employed People (unit:1000people)	Ratio to the Whole Country in 2001(%)
The Whole Country	1991	60,019	
	1996	62,781	
	2001	60,158	100
NOWPAP Region	2001	16,623	27.6
	Hokkaido	2,585	4.3
	Aomori	633	1.1
	Akita	523	0.9
	Yamagata	570	1.0
	Niigata	1,178	2.0
	Toyama	579	1.0
	Ishikawa	601	1.0
	Fukui	422	0.7
	Kyoto	1,202	2.0
	Hyogo	2,330	3.9
	Tottori	280	0.5
	Shimane	352	0.6
	Yamaguchi	687	1.1
	Fukuoka	2,255	3.5
	Saga	388	0.6
	Nagasaki	630	1.1

Interannual change of the Industrial Conditions



Interannual change of the Amount of Manufactured Goods Produced and Shipped



Interannual Change of the Number of Employees in Manufacturing Industry

The Conditions of Public Sewage Systems

Prefecture		Public Sewage Systems				
		Present population in districts with sewage system (unit:1,000)	Planned area of districts with sewage system (ha)	Present area of districts with sewage treatment (ha)	Enforcement rate vs. planned area (%)	Number of sewage treatment terminals
The entire Japan	1980	32,724	909,399	283,646	31.2	439
	1985	41,178	1,048,626	426,627	40.7	568
	1990	53,996	1,326,252	644,957	48.6	744
	1995	66,838	1,668,300	896,561	53.7	997
	2000	78,852	1,965,446	1,186,123	60.3	1,476
	2001	81,262	2,010,290	1,246,640	62.0	1,569
Hokkaido		4,752	135,952	103,702	76.3	166
Aomori		616	26,319	13,178	50.1	19
Akita		466	20,881	13,018	62.3	24
Yamagata		672	24,158	12,386	51.3	29
Niigata		1,164	48,056	26,354	54.8	75
Toyama		708	27,042	17,550	64.9	30
Ishikawa		712	24,921	15,387	61.7	43
Fukui		468	20,182	12,167	60.3	26
Nagano		1,341	66,121	40,583	61.4	90
Kyoto		2,157	36,678	27,217	74.2	32
Hyogo		4,707	105,496	71,713	68.0	104
Tottori		285	11,698	6,812	58.2	29
Shimane		205	11,987	5,925	49.4	20
Yamaguchi		734	31,690	16,778	52.9	32
Fukuoka		3,295	73,746	49,103	66.6	31
Saga		251	13,595	5,628	41.4	13
Object region total		22,533	676,744	433,050	64.6	763
Contribution to entire Japan(%)		27.7%	33.7%	34.7%		48.6%

3. National Monitoring and Assessment Activities

Four categories of land based pollutant sources in Japan

1) Domestic wastewater

Wastewater from the sewage treatment system, Johkasou (Septic Tank) and other living drainage.

2) Industrial wastewater

Wastewater from the industrial facilities.

3) Non-point source

Wastewater from non-point sources such an agricultural land, forest, grass field, and urban area.

4) Direct discharge to sea

Direct discharge is restricted with International Convention, i.e. London Convention and related civil laws.

A. Relevant Statutes Concerning the Discharge of Pollutants to Rivers or Directly to the Marine Environment

	Source	Category	Relevant Statute	Load Amount Estimation Data
Environment Basic Law				
Municipal wastewater	Public sewage		Water Pollution Control Law [1] Sewage Law	Administrative monitoring
	The night soil treatment plant		Water Pollution Control Law [1] Wastes Management and Public Cleansing Law [3]	
	Johkasou (Septic tank)	More than 501 person Johkasou	Water Pollution Control Law [1] Johkasou (Septic Tank) Law	Reported parameter data (monitoring)
		Less than 501 person Johkasou		Basic unit data
Industrial wastewater	Specified facilities [2]		Water Pollution Control Law [1]	Written report parameter data Monitoring (record obligation)
	Non-specific facilities			None data
Non-point source wastewater	Natural load	Agriculture	Environment Basic Law (monitoring of public water area)	Basic unit data
		Livestock industry		Land use data
		Natural originating		Industrial, statistical data
	Urban load	Urban area		Land use data according to land category
		City activity		Basic unit according to land category
Ocean Dumping	Municipal waste		London Convention [4] Wastes Management and Public Cleansing Law [3] Marine Pollution Prevention Law [5] Public Water Body Reclamation Law	Water quality monitoring of dumping site
	Industrial waste			
	Dredged soil			
	Vessel waste	Oil, hazardous substance, and waste	Marine Pollution Prevention Law [5]	

B. Environmental Quality Standards of Water for Protecting the Human Health

	Item	Standard Value
1	Cadmium	0.01 mg/L or less
2	Total cyanide	not detectable
3	Lead	0.01 mg/L or less
4	Chromium (VI)	0.05 mg/L or less
5	Arsenic	0.01 mg/L or less
6	Total mercury	0.0005 mg/L or less
7	Alkyl mercury	not detectable
8	PCBs	not detectable
9	Dichloromethane	0.02 mg/L or less
10	Carbon tetrachloride	0.002 mg/L or less
11	1, 2-dichloroethane	0.004 mg/L or less
12	1, 1-dichloroethylene	0.02 mg/L or less
13	cis-1, 2-dichloroethylene	0.04 mg/L or less
14	1, 1, 1-trichloroethane	1.0 mg/L or less
15	1, 1, 2-trichloroethane	0.006 mg/L or less
16	Trichloroethylene	0.03 mg/L or less
17	Tetrachloroethylene	0.01 mg/L or less
18	1, 3-dichloropropene	0.002 mg/L or less
19	Thiuram	0.006 mg/L or less
20	Simazine	0.003 mg/L or less
21	Thiobencarb	0.02 mg/L or less
22	Benzene	0.01 mg/L or less
23	Selenium	0.01 mg/L or less
24	Nitrate nitrogen and Nitrite nitrogen	10 mg/L or less
25	Fluorine	0.8 mg/L or less
26	Boron	1 mg/L or less

C. Environmental Quality Standards of Water for Protecting the Living Environment (River)

Class	Item	Standard Value				
	Water Use	pH	BOD	SS	DO	Total Coliform
AA	Water supply class 1, conservation of natural environment, and uses listed in A-E	6.5-8.5	1 mg/L or less	25 mg/L or less	7.5 mg/L or more	50 MPN/100 ml or less
A	Water supply class 2, fishery class 1, bathing and uses listed in B-E	6.5-8.5	2 mg/L or less	25 mg/L or less	7.5 mg/L or more	1000 MPN/100 ml or less
B	Water supply class 3, fishery class 2, and uses listed in C-E	6.5-8.5	3 mg/L or less	25 mg/L or less	5 mg/L or more	5000 MPN/100 ml or less
C	Fishery class 3, industrial water class 1, and uses listed in D-E	6.5-8.5	5 mg/L or less	50 mg/L or less	5 mg/L or more	-
D	Industrial water class 2, agricultural water, and uses listed in E	6.0-8.5	8 mg/L or less	100 mg/L or less	2 mg/L or more	-
E	Industry water class 3 and conservation of environment	6.0-8.5	10 mg/L or less	Floating Matter such as garbage should not be observed	2 mg/L or more	-

D. Environmental Quality Standards for Conservation of the Living Environment of Rivers (aquatic organisms)

Class	Adaptability of Living Condition of Aquatic Organisms	Standard Value
		Total Zinc
Aquatic Organisms A	The water bodies where aquatic organisms, such as char and salmon, (those that prefer comparatively cold water) live as well as their prey.	0.03mg/L or less
Aquatic Organisms Special A	The water bodies that require special protection, as these are suitable for spawning (breeding areas), and/or nursery places for immature aquatic life that are specified in the column “Aquatic Organisms A”.	0.03mg/L or less
Aquatic Organisms B	The water bodies where aquatic life such as carp and crustaceans that prefer comparatively warm water live as well as their prey.	0.03mg/L or less
Aquatic Organisms Special B	The water bodies that require special protection, as these are suitable for spawning (breeding areas), and/or nursery places for immature aquatic life that are specified in the column “Aquatic Organisms B”.	0.03mg/L or less

E. Additional Monitoring Substances and Guideline Values for Water

	Categories	Guideline value
1	Chloroform	0.06 mg/L or less
2	trans-1, 2-dichloroethylene	0.04 mg/L or less
3	1, 2-dichlorpropane	0.06 mg/L or less
4	p-dichlorobenzene	0.2 mg/L or less
5	Isoxathion	0.008 mg/L or less
6	Diazinon	0.005 mg/L or less
7	Fenitrothion (MEP)	0.003 mg/L or less
8	Isoprothiolane	0.04 mg/L or less
9	Oxine copper	0.04 mg/L or less
10	Chlorothalonil (TPN)	0.05 mg/L or less
11	Propyzamide	0.008 mg/L or less
12	EPN	0.006 mg/L or less
13	Dichlorvos (DDVP)	0.008 mg/L or less
14	Fenobucarb (BPMC)	0.03 mg/L or less
15	Iprobenphos (IBP)	0.008mg/L or less
16	Chlornitrofen (CNP)	–
17	Toluene	0.6mg/L or less
18	Xylene	0.4mg/L or less
19	di (2-etylhexyl) phatalate	0.06mg/L or less
20	Nickel	–
21	Molybdenum	0.07mg/L or less
22	Antimony	0.02mg/L or less
23	Vinyl chloride monomer	0.002mg/L or less
24	Epichlorohydrin	0.0004mg/L or less
25	1,4-dioxane	0.05mg/L or less
26	Total manganeses	0.2mg/L or less
27	Uranium	0.002mg/L or less

F. Parameters to be Monitored, Waters Classifications, and Guideline Values for the Conservation of Aquatic Organisms

Categories	Water Area	Class	Guideline Value
Chloroform	River and Lakes	Aquatic Organisms A	0.7 mg/L or less
		Aquatic Organisms special A	0.006 mg/L or less
		Aquatic Organisms B	3 mg/L or less
		Aquatic Organisms special B	3 mg/L or less
	Coastal Areas	Aquatic Organisms A	0.8 mg/L or less
		Aquatic Organisms special A	0.8 mg/L or less
Phenol	River and Lakes	Aquatic Organisms A	0.05 mg/L or less
		Aquatic Organisms special A	0.01 mg/L or less
		Aquatic Organisms B	0.08 mg/L or less
		Aquatic Organisms special B	0.01 mg/L or less
	Coastal Areas	Aquatic Organisms A	2 mg/L or less
		Aquatic Organisms special A	0.2 mg/L or less
Formaldehyde	River and Lakes	Aquatic Organisms A	1 mg/L or less
		Aquatic Organisms special A	1 mg/L or less
		Aquatic Organisms B	1 mg/L or less
		Aquatic Organisms special B	1 mg/L or less
	Coastal Areas	Aquatic Organisms A	0.3 mg/L or less
		Aquatic Organisms special A	0.03 mg/L or less

G.-1 National Effluent Standards (Items related to the protection of the human health)

	Substance	Permissible Limits
1	Cadmium and its compounds	0.1mg/L
2	Cyanide compounds	1mg/L
3	Organic phosphorus compounds (parathion, methyl parathion, methyl demeton and EPN only)	1mg/L
4	Lead and its compounds	0.1mg/L
5	Chromium compounds	0.5mg/L
6	Arsenic and its compounds	0.1mg/L
7	Total mercury	0.005mg/L
8	Alkyl mercury compounds	Not detectable
9	PCBs	0.003mg/L
10	Trichloroethylene	0.3mg/L
11	Tetrachloroethylene	0.1mg/L
12	Dichloromethane	0.2mg/L
13	Carbon tetrachloride	0.02mg/L
14	1,2-dichloro ethane	0.04mg/L
15	1,1-dichloro ethylene	0.2mg/L
16	cis-1,2-dichloro ethylene	0.4mg/L
17	1,1,1-trichloro ethane	3mg/L
18	1,1,2-trichloro ethane	0.06mg/L
19	1,3-dichloropropene	0.02mg/L
20	Thiram	0.06mg/L
21	Simazine	0.03mg/L
22	Thiobencarb	0.2mg/L
23	Benzene	0.1mg/L
24	Selenium and its compounds	0.1mg/L
25	Boron and its compounds	Excluding the sea area: 10mg/L. Sea area: 230mg/L
26	Fluorine and its compounds	Excluding the sea area: 8mg/L. Sea area: 15mg/L
27	Ammonia, Ammonium compound, Nitrite compounds, and Nitrate compounds	100mg/L*

G.-2 National Effluent Standards (Items related to the protection of the living environment)

	Aquatic Life Parameters	Permissible Limits
1	Hydrogen ion activity (pH)	Excluding the sea area: 5.8-8.610mg/L. Sea area: 5.0-9.0
2	Biochemical Oxygen Demand (BOD)	160mg/L (Daily Average 120mg/L)
3	Chemical Oxygen Demand (COD)	160mg/L (Daily Average 120mg/L)
4	Suspended solids (SS)	200mg/L (Daily Average 150mg/L)
5	N-hexane extracts (mineral oil)	5mg/L
6	N-hexane extracts (animal and vegetable fats)	30mg/L
7	Phenols	5mg/L
8	Copper	3mg/L
9	Zinc	5mg/L
10	Dissolved iron	10mg/L
11	Dissolved manganese	10mg/L
12	Chromium	2mg/L
13	Number of coliform groups	3,000/cm^3 (Daily Average)
14	Nitrogen	120mg/L (Daily Average 60mg/L)
15	Phosphorus	16mg/L (Daily Average 8mg/L)

H. Environmental Standards for Dioxins Concerning Water Quality

Medium	Standard value	Measuring method
Water quality (The bottom sediment is excluded.)	1pg-TEQ/L or less	Method of providing in Japan Industrial Standards K0312
Bottom sediment quality	150pg-TEQ/g or less	Method to extract dioxins included in bottom sediment by Soxhlet extractor, and to measure by high-resolution gas chromatography / high-resolution mass spectrometry.

Notes
1. The standard value is converted into the toxicity of 2,3,7,8-tetrachlorinated dibenzo-para-dioxin.
2. Standard values of water quality (the bottom sediment is excluded) are set in terms of annual averages.

I. Conducting the Water Quality Monitoring

The prefectural governors and mayors of designated cities conduct continuous monitoring of water quality of public water bodies as mandated by the Water Pollution Control Law.

The public waters covered by this monitoring include those to which the category types of EQS are applied, and for which the Ministry of the Environment is promoting the necessary expenditure.

Moreover, the governor of a prefecture can request a report from any factories and business establishments or conduct on-site inspections, if necessary to check their compliance with the effluent standards.

When necessary to obtain compliance, the prefecture may issue administrative orders requiring improvements to the factory or establishment designed to bring them into compliance.

J. Outline of Water Quality Monitoring Plan (National Program)

Water Type	Person Responsible for Observation	Number of Survey Points	Content of Observations	Frequency
Public water area (river, lakes and coastal area)	Prefectural governor and government ordinance mayor	Environmental standards monitoring point (8,600 points in entire Japan as of 2002)	Environmental quality standard item concerning protection of human health	More than once a month
			Environmental quality standard item concerning conservation of living environment	More than once a month
Industrial waste water	Operating company	Specified facilities under the water pollution control law	Effluent standard item	Measuring according to the situation of the impact of effluent quality.

J.-1 Outline of Water Quality Monitoring Plan (National Program)

1) Monitoring Parameters

The monitoring parameters for public water bodies consist of the environmental quality standards for protection of human health, the conservation of living organisms, and effluent standard parameters.

2) Monitoring Points

The total number of the monitoring points in public water bodies is about 8,600 points (results in 2002) in all of Japan.

The total number of the environmental standard points and the supplementary points on the first class rivers is 247 in the NOWPAP region (35 rivers).

J.-2 Outline of Monitoring Plan for Seawater Pollution

The Ministry of the Environment, the Meteorological Agency, and the Japan Coast Guard are each executing the monitoring of coastal waters for the purposes specified under the Water Pollution Control Law, as outlined below.

1) Oceanic Monitoring by the Ministry of the Environment

An annual survey has been conducted to measure the concentration of oil, PCB, and heavy metals, as well as general water quality parameters, such as water temperature, salinity, etc. In this survey, the sampling points are established along observation lines from the coast toward offshore for surveying the effect of land-based pollution. Sampling points are also established in the waste dumping area designated by The Marine Pollution Prevention Law.

J.-3 Outline of Monitoring Plan for Seawater Pollution (2)

2) Marine Monitoring by the Meteorological Agency

The Meteorological Agency began the oceanic background pollution survey of heavy metals (cadmium and mercury) in seawater under the Marine Pollution Prevention Law in 1972. Subsequently, the survey related to oil pollution began in 1976.

3) Marine Monitoring by the Japan Coast Guard

The Japan Coast Guard, Hydrographic and Oceanographic Department has been conducting the survey of seawater and marine debris and analyzing the concentrations of oil, PCB, and heavy metals (cadmium and mercury) in the sea around Japan, the principal bays continuously since 1972.

K.-1 Method of Analysis of Water Quality and Frequency of Monitoring

The principal methods for water quality analysis are described in the publication Water Quality Analysis Methods (issued by Ministry of the Environment, 1971).

The water quality monitoring that will be conducted by prefectures and factories shall be according to the methods described in this manual.

The analytical methods required for various water quality monitoring parameters are summarized in next table.

K.-2 Monitoring Parameters and Their Analytical Methods

Item	Preservation Method	Major Analytical Method	Measurement Range and Accuracy (minimum limit of detection: mg/L)
pH	Dark and cool, 0～5℃	Glass electrode method	-
BOD (Biological Oxygen Demand)	Dark and cool, 0～5℃	Membrane electrode method	0.5
SS (Suspended Solid)	Dark and cool, 0～5℃	Filter and weigh method	1.0
DO (Dissolved Oxygen)	Dark and cool, 0～5℃	Membrane electrode method	0.5
Total coliforms	Dark and cool, 0～5℃	MPN method	-
Cadmium	Add HCl and pH<1	Atomic absorption method	0.001
Total cyanide	Add NaOH and pH>11	Absorptiometric method	0.1
Lead	Add HCl and pH<1	Atomic absorption method	0.005
Chromium (VI)	Add HCl and pH<1	Atomic absorption method	0.004
Arsenic	Add HCl and pH<1	Absorptiometric method	0.005
Total mercury	Add HCl and pH<1	Atomic absorption method	0.0005
Alkyl mercury	Add HCl and pH<1	Gas chromatograph	0.0005
PCBs	Dark and cool, 0～5℃	Gas chromatograph	0.0005
Dichloromethane	Dark and cool, 0～5℃	Gas chromatograph	0.002
Carbon tetrachloride	Dark and cool, 0～5℃	Gas chromatograph	0.0002
1, 2-dichloroethane	Dark and cool, 0～5℃	Gas chromatograph	0.0004
1, 1-dichloroethylene	Dark and cool, 0～5℃	Gas chromatograph	0.002
cis-1, 2-dichloroethylene	Dark and cool, 0～5℃	Gas chromatograph	0.004
1, 1, 1-trichloroethane	Dark and cool, 0～5℃	Gas chromatograph	0.0005
1, 1, 2-trichloroethane	Dark and cool, 0～5℃	Gas chromatograph	0.0006
Trichloroethylene	Dark and cool, 0～5℃	Gas chromatograph	0.002
Tetrachloroethylene	Dark and cool, 0～5℃	Gas chromatograph	0.0005
1, 3-dichloropropene	Dark and cool, 0～5℃	Gas chromatograph	0.0002
Thiuram	Dark and cool, 0～5℃	High-performance liquid chromatograph	0.0006
Simazine	Dark and cool, 0～5℃	Gas chromatograph	0.0003
Thiobencarb	Dark and cool, 0～5℃	Gas chromatograph	0.002
Benzene	Dark and cool, 0～5℃	Gas chromatograph	0.001
Selenium	Add HCl and pH<1	Absorptiometric method	0.002
Ammonium nitrogen	Dark and cool, 0～5℃	Absorptiometric method	0.7
Nitrate nitrogen	Dark and cool, 0～5℃	Absorptiometric method	0.2
Nitrite nitrogen	Dark and cool, 0～5℃	Absorptiometric method	0.2
Fluorine	Dark and cool, 0～5℃	Absorptiometric method	0.2
Boron	Dark and cool, 0～5℃	Absorptiometric method	0.2

L.-1 Research Activities

The load of a particular substance carried by rivers as input into the seas is basically calculated by the products of

(a) its concentration and,

(b) the rate of water discharge

(c) at a given points, taking into account any diversions from the given watershed.

The existing data are not fully sufficient for providing these three quantities.

Furthermore, load assessment could not be completed based solely on the monitoring data but needs certain models to estimate unknown variables.

L.-2 Research Activities (2)

A group of researchers from the field of civil engineering has systematically assessed environmental changes in rivers based on the data of the River Water Quality Monitoring by the Ministry of Land, Infrastructure and Transport (MLIT), and proposed the addition of inorganic nutrients to the monitoring parameters.

The Japanese Government started the Global Water Cycle Research Initiative (GWCRI) in 2003 encompassing the global observation, development of the model, and assessment of the effect of the hydrological changes to human society.

A research program called The R & D of Hydrological Modeling and Water Resources Systems started in 2001 targeting the construction of a water cycle model considering the man-made effects.

L.-3 Research Activities (3)

UNESCO-GRAPHIC (Groundwater Resources Assessment under the Pressures of Humanity and Climatic Change) started in 2004. One of the purposes is to understand the flux of the ground water. This flux is thought to amount to 10% of the global water flux from land to the sea.

The exports of substances via rivers from watersheds have been recognized as an important component of LOICZ (Land-Ocean Interactions in the Coastal Zone） under IGBP (International Geosphere-Biosphere Program). Recently, a group of researchers proposed "Global NEWS (Global Nutrient Export from Watersheds)" as a program of LOICZ to construct a spatially explicit, multi-element (N, P, Si & C) model understanding the human and natural processes.

“Silica deficiency hypothesis” - Decreased Si discharge due to dam construction and increased N&P discharge from human activities must stimulate the non-siliceous and potentially harmful algae in the coastal areas – is a target of a project supported by Ministry of the Environment.

M.-1 Training Activities

1) The Ministry of the Environment: National Environmental Research and Training Institute

Analysis Training of National Environmental Research and Training Institute

Content of analysis training	
Analysis equipment training and specific analysis equipment training	
Analysis training	Atmospheric analysis, odor substances analysis, and water analyses
	Waste analysis and VOCs analysis
Theme analysis	Ⅰ (marine plankton)
	Ⅱ (plankton)
	Ⅲ (benthos)
Endocrine disrupters analysis	
Dioxins environmental monitoring (exhaust gas and wastewater)	
The latest analysis technology (LC/MS analysis) and special analysis	

M.-2 Training Activities (2)

2) Training Program of the Japan Sewage Works Agency

Content of the Training of Japan Sewage Works Agency

1) Content of training of maintenance management course
2) Drainage system management
3) Consignment of administrative work
4) Treatment plan management
5) Treatment plant administration
6) Rebuilding and updating of treatment plant equipment
7) Water quality control
8) Control the processed effluent
9) Equipment and facilities management
10) Start and preparation of service
11) Promotion of water closet and information disclosure

4. Present Situation of Rivers and Direct Discharge of Pollution to the Marine Environment

1) Current Status of the Major River Water Quality

The results of monitoring the water quality of the major rivers (the first class rivers) that flow in the NOWPAP region in fiscal year 2002 are summarized as next slide.

The mean value of BOD is in the range of 0.5-2.1mg/L, and COD is 1.7-5.5mg/L. COD and BOD are indexes of organic pollution in rivers that flow in the NOWPAP region.

A.

Water Quality of the Rivers that Flow into the NOWPAP Region in Fiscal Year 2002

	Rivers	SS	BOD_5	COD	DO	NO_2-N	NO_3-N	Pb dissolved	Cd dissolved
1	Teshio River	5	0.6	3.6	11			<0.005	
2	Ishikari River	35	1.0	4.9	10				
3	Rumoi River	15	2.1	5.5	11	0.043	0.117	0.008	<0.001
4	Shiribetsu River	4	0.5	2.4	12				
5	Shiribeshitoshibetsu River	4	0.6	2.6	11			<0.005	<0.001
6	Iwaki River	15	1.7	3.8	9.9	0.044		0.002	<0.001
7	Yoneshiro River	5	1.2		11			<0.005	<0.001
8	Omono River	9	1.2		10			<0.005	<0.001
9	Koyoshi River	9	1.2		10			<0.005	<0.001
10	Mogami River	17	0.9	2.5	11			<0.005	<0.005
11	Aka River	11	0.8	2.1	11	0.01	0.2	<0.005	<0.005
12	Ara River	4	0.6	2.2	11	<0.01	0.22	<0.005	<0.001
13	Agano River	8	0.8	2.5	11				
14	Shinano River	13	1.2	3.2	9.3				
15	Seki River	25	1.2	3.9	10	0.02	0.41	<0.005	<0.001
16	Hime River	95	0.9	3.5	11				
17	Kurobe River	7	0.6	1.7	12	<0.05	0.16	<0.005	<0.001
18	Joganji River	9	0.8	2.1	11	<0.05	0.24	<0.005	<0.001
19	Jintu River	7	1.3	2.4	11	<0.05	0.62	<0.005	<0.001
20	Sho River	10	0.9	2.4	11				
21	Oyabe River	8	2.1	4.4	9.2	<0.05	0.77	<0.005	<0.001
22	Tedori River	34	1.1		11	0.01	0.34	<0.005	<0.001
23	Kakehashi River	11	0.8		10	0.01	0.4	0.005	<0.001
24	Kuzuryu River	9	1.4	3.7	10			<0.002	<0.001
25	Kita River	9	0.6	2.3	9.4			<0.002	<0.001
26	Yura River	4	0.7	2.5	9	0.01	0.61	<0.005	<0.005
27	Maruyama River	5	2.0		9.7			0.002	<0.001
28	Chiyo River	3	1.4	1.9	9.1			<0.005	<0.002
29	Tenjin River	2	0.8	1.8	11			<0.005	<0.002
30	Hino River	16	1.3	3.5	9.6			<0.005	<0.002
31	Hii River	7	1.3		10	0.003	0.317	<0.005	<0.005
32	Gono River	2	0.5		9.8			<0.005	<0.005
33	Takatsu River	2	0.5		9.1			<0.005	<0.005
34	Onga River	7	1.7	3.3	8.5			<0.005	<0.001
35	Matsuura River	14	0.9	3.2	8.3			<0.005	<0.001

(unit: mg/L)

B. Estimates of the pollutant loads

The pollution loads to the NOWPAP region were estimated by multiplying the volumetric flow rates by the concentrations of various pollutants in each river.

BOD, COD, and SS are the general water quality parameters considered to be good indexes for assessing organic water pollution caused by human activity.

The pollution loads for the Ishikari, Omono, Mogami, Agano, and Shinano Rivers, located in the Hokkaido and Hokuriku regions, indicate these rivers carry especially large pollution loads.

C.

Annual Pollution Loads of Rivers that Flow into the NOWPAP Region in Fiscal Year 2002

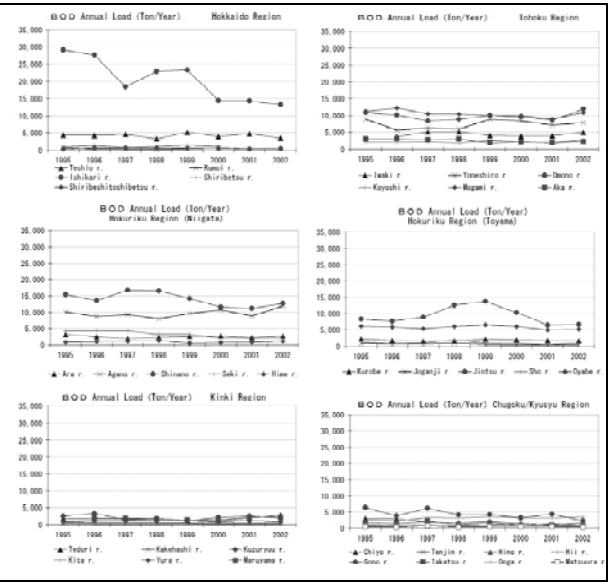
	Rivers	BOD	COD	SS	NO_2-N	NO_3-N	Pb (dis)	Cd (dis)
1	Teshio river	3,550	21,297	29,579			–	
3	Ishikari river	14,439	70,753	505,379	14	37	2.6	–
2	Rumoi river	671	1,757	4,792	–	–		
4	Shiribetsu river	927	4,450	7,416				
5	Shiribeshitoshibetsu river	414	1,792	2,758			–	–
6	Iwaki river	4,946	11,055	43,638	128		5.8	–
7	Yonesiro river	8,461		35,256			–	–
8	Omono river	11,917		89,376			–	–
9	Koyoshi river	3,076		23,066			–	–
10	Mogami river	11,571	32,141	218,557			–	–
11	Aka river	2,478	6,505	34,076	31	620	–	–
12	Ara river	2,740	10,048	18,269	–	1,005	–	–
13	Agano river	11,973	37,414	119,726				
14	Shinano river	15,294	40,784	165,684	–	–	–	–
15	Seki river	2,076	6,748	43,260	35	709	–	–
16	Hime River	1,243	4,834	131,221	–	–	–	–
17	Kurobe river	1,607	4,553	18,746	–	428	–	–
18	Joganji river	372	977	4,186	–	112	–	–
19	Jintu river	6,598	12,182	35,530	–	3,147	–	–
20	Sho river	1,052	2,804	11,684	–	–	–	–
21	Oyabe river	4,669	9,782	17,786	–	1,712	–	–
22	Tedori river	2,803		86,625	25	866	–	–
23	Kakehashi river	486		6,678	6	243	3.0	–
24	Kuzuryu river	2,072	5,475	13,317			–	–
25	Kita river	90	347	1,357			–	–
26	Yura river	1,036	3,699	5,919	15	903	–	–
27	Maruyama river	2,179		5,448			2.2	–
28	Chiyo river	1,634	2,217	3,500			–	–
29	Tenjin river	335	754	838			–	–
30	Hino river	921	2,479	11,333			–	–
31	Hii river	1,610		8,669	4	393	–	–
32	Gono river	1,879		7,517			–	–
33	Takatsu river	486		1,945			–	–
34	Onga river	460	893	1,894			–	–
35	Matsuura river	134	476	2,084			–	–
	Nominally Total	126,197		1,717,108				

(unit: ton/year)

D.

Change of Annual Pollution Loads of Rivers

1995-2002



5. Proposals for Future Regional Activities

At present, the Japanese government is promoting the following management approaches for the aquatic environment in Asia.

1) The Water Environmental Partnership in Asia (WEPA) proposal aimed at enhancing governance in conservation of aquatic environments and capacity building in Asia.

2) The Network of Asian River Basin Management Organizations (NARBO) established in February 2004, which aims at sharing technology and information among the Asian countries, and Japan will support the cooperation among the member countries.

3) In addition, the Ministry of the Environment is starting its survey on marine litters in the Japanese waters in the fiscal year 2005.

6. Conclusion

- In Japanese regulatory system, environmental quality standards are defined by *the Basic Environment Law* for each type of water body, including rivers, lakes and coastal areas, and effluent standards are defined by *the Water Pollution Control Law* and *the Sewage Law*.
- This report also describes the water quality monitoring systems in place within the region, including research activities aimed at improving the interpretation and predictive analysis of monitoring data. There are a total of 16 prefectures facing the NOWPAP region in Japan, though the descriptions in this report cover over 21 prefectures.

- Under the nationwide monitoring programs in Japan, each prefecture is responsible for monitoring water quality by measuring various parameters, including heavy metals; chlorinated hydrocarbons; and organic pollution indexes, such as COD, BOD, and DO.
- The prefectures are responsible for conducting these measurements at a frequency of about once a month at the environmental quality standard points in the rivers and coastal areas.
- The flow rates of the major rivers are also measured; therefore, the pollutant load that flows in the NOWPAP region can be estimated from the water quality concentration and the flow rate data.

- The theme of the "River and Direct Inputs to the Sea" corresponds to the action to deal with the watershed, the river and the sea as an aquatic continuum.
- To this end, we need to organize certain environmental indices that are common to each of the three parts of the continuum.
- The present situation, for example BOD for the river environment and COD for the marine environment, is not ideal. Also the difference among the dimension of the sea is far larger than those of the watersheds and rivers.
- As a result, the change in the marine environment is seemingly very subtle compared to those in the watersheds and rivers. The situation can be past cure once the adverse change become visible in the NOWPAP region, which is basically a semi-closed sea and the inputs can be accumulated.
- Therefore precautionary approaches are particularly needed in terms of the assessment and counter measures based on the soundly designed monitoring programs.

Appendix II

National Report of China on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in the NOWPAP Region

By National Expert of China

National Report of China

On River and Direct Inputs of Contaminants into the Marine and Coastal Environment in the NOWPAP Region

Ms. Wang Mingcui, Senior Engineer (CNEMC)
Mr. Su Yibing, Senior Engineer (CRAES)
2nd Joint Meeting of NOWPAP POMRAC Working Group 2
Vladivostok, Russian, Oct. 10-11, 2005

Contents

1. Executive Summary

This National report of China is a draft, that prepared for Working Group 2 (WG2), based on the decisions of the POMRAC Focal Point Meetings in the year 2004. It will contribute to the requirement of the regional report and the following working plan as well.
The final National report, therefore, will be completed according to the decisions of this WG2 Meeting.

2. Introduction

2.1 Goals and objectives

1) The Regional Seas Programme of UNEP has been promoted as an action-oriented program for management of marine and coastal environments in collaboration with regional countries.
2) As a part of the program, NOWPAP was adopted at the First Intergovernmental Meeting (IGM) in Seoul, Korea, on September 1994, attended by China, Japan, Korea, and Russia.

2. Introduction

2.1 Goals and objectives(cont.)

3) The Pollution Monitoring Regional Activity Centre (POMRAC) was established as one of four Regional Activity Centres of NOWPAP. Working Group 2 (WG2) of POMRAC. focuses on water pollution discharged to rivers or directly into the marine environment.

4) The report will be contributed to the WG2. The goals and objectives are identification of the status and background for preparing whole regional pollution monitoring activities at next stage.

2. Introduction

2.2 Background

1) For nearly three decades, UNEP has fostered regional cooperation on behalf of the marine and coastal environment. It has accomplished the cooperation by stimulating the creation of "Action Plans"- prescriptions for sound environmental management- for each region. Now, more than 140 coastal countries are participating in 13 Regional Seas Programmes established under UNEP auspices. Five partner programs are also fully operational.

2. Introduction

2.2 Background (cont.)

2) NOWPAP or, in full, Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region is one of the 'Action Plans' which covers the Northwest Pacific region. The area surrounding the Northwest Pacific is one of the most highly populated parts of the world and is receiving enormous pressures on the environment. The countries of the region, China, Japan, Korea and Russia participate in NOWPAP by joining forces.

2. Introduction

2.2 Background (cont.)

3) The IGM, made up of senior representatives of the NOWPAP members, provides policy guidance and decision-making for NOWPAP. The plan incorporates seven priority projects to be implemented through a network of Regional Activity Centres (RACs) - CEARAC, DINRAC, MERRAC and POMRAC. The RACs play a central role in coordinating regional activities in specific fields of priority projects. NOWPAP's Regional Coordinating Unit (RCU), co-hosted by Japan and the Republic of Korea, serves as nerve center and command post of the Action Plan's activities.

2. Introduction

2.2 Background (cont.)

4) The activities agreed upon as part of the implementation of NOWPAP are financed principally by contributions from the Members, international organizations and non-governmental organizations to the NOWPAP Trust Fund.

2. Introduction

2.2 Background (cont.)

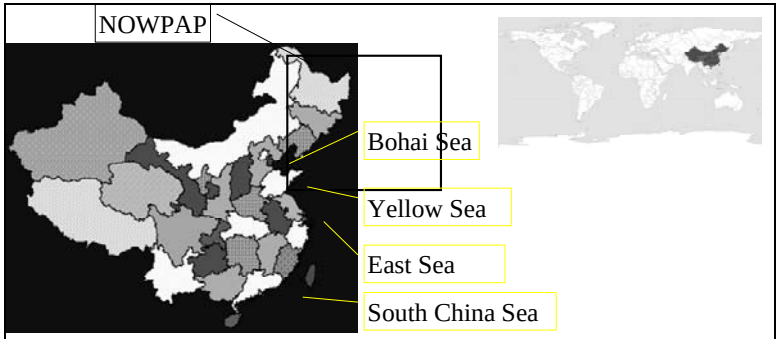
5) So far, the priority projects of NOWPAP are set as following:

- **NOWPAP1: Establishment of a comprehensive database and information management system;**
- **NOWPAP2: Formation of a survey of national environmental legislation, objectives, strategies and policies;**
- **NOWPAP3: Establishment of a collaborative regional monitoring program;**
- **NOWPAP4: Development of effective measures for regional cooperation in marine pollution preparedness and response;**
- **NOWPAP5: Establishment of Regional Activity Centre (RAC) and the network among these centers;**
- **NOWPAP6: Promotion of public awareness of the marine, coastal, and associated freshwater environments;**
- **NOWPAP7: Assessment and management of land-based activities.**

2. Introduction

2.3 General information - Coastal and seas

China is a big coastal country in Asia. The total sea area, totally 4,730,000 km^2, is divided into four sea areas from the north to the south, including the Bohai Sea, the Yellow Sea, the East Sea and the South China Sea. The length of the mainland coastline is more than 18,000 km and that of the island coastline is about 14,000 km.



Seas	Area of sea		Fishery area		Depth (m)	
	10^3 ha	%	10^3 ha	%	Ave.	Max.
Bohai	7,700	1.6	7,700	100.0	18	70
Yellow	38,000	8.0	35,300	92.9	44	140
East	77,000	16.3	54,900	71.3	370	2,719
South China	350,000	74.0	182,100	52.0	1,212	5,559
Total	472,700	100.0	280,000	59.2	-	-

2. Introduction

2.3General information - Environmental management

With the developing activities at land-based basins, many rivers input drainages with contaminants into the marine and coast environments. Most wastewater sources have been treated well before discharge, but some not yet. To manage and control the pollution, therefore, many laws and legislations, from national and local, are set for management of the environmental quality and discharging sources.

2. Introduction

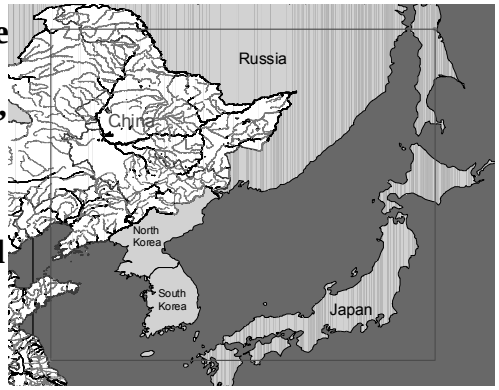
2.3General information – standards and main parameters

There two kinds standards, environmental quality and effluent quality, are important and basic requirements to protect environments and reduce pollutants loads, although many different between those standards and being revised. Besides, the standards of environments are divided for surface waters, underground waters, marine waters, and for special usage waters as well. General speaking, the main controlled contaminations are chemical oxygen demand (COD) and ammonia nitrogen (NH_3-N) in fresh water, and COD, biochemical oxygen demand (BOD), inorganic nitrogen (IN), and active phosphate (P) in marine water.

2. Introduction

2.4 Geographical scope

According to the United Nation's principal (1997), the NOWPAP region includes marine, near-shore coasts and offshore basins at 33°-52°N and 121°-143°E.



2. Introduction

2.4 Geographical scope (cont.)

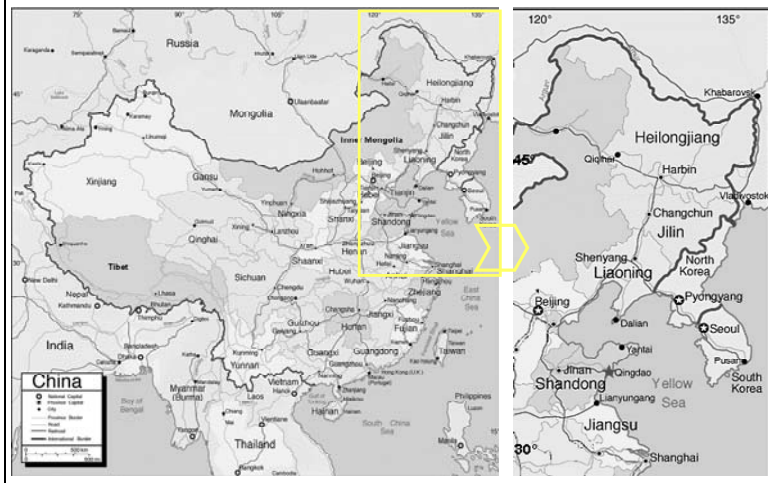
The Chinese marine parts in NOWPAP mainly refer to the Yellow Sea, belonging to Liaoning, Shandong and Jiangsu three Provinces. The terrestrial parts include Heilongjiang, Jilin, Liaoning, Jiangsu, and Shandong five provinces or municipality. The total land surface area of the basin and the total length of the coastline is about 1,004,000km^2 and 6054 km, respectively. The regional area accounts for 10.8% of the entire area of China. The number of major rivers in these basins is 7, and the amount of a total discharge was about 1193.1 billion tons/year in fiscal year 2002. There are three parts of basins in National Water Resources' First Zones, Songhuajiang, Liaohe and Huaihe basins, are covered in NOWPAP region, with thousands rivers, lakes and reservoirs.

2.4 Geographical scope (cont.)

(1) <u>Major cities, rivers and coastline</u>

The major cities include Harbin, Changchun, Shenyang, Dalian, Yantai, Qingdao, Lianyungang and Shanghai. The GDP from the related provinces is up to 3784 billion RMB, which 36.5% of the nationwide total, and industrial output keep increasing up to now.

The major rivers of the region include Songhua River, Liao River, Yellow River, Yangtse River, Huai River and Hai River.



Chinese rivers in the region of NOWPAP

Annual discharge of major rivers

Items	Songhua River	Liaohe River	Haihe River	Yellow River	Huai River	Yangtze River
Area (10^4m^2)	55.7	22.9	26.4	75.2	26.9	180.9
Length (km)	2308	1390	1090	5456	1000	6300
Annual precipitation (mm)	527	473	559	475	889	1070
Average discharge ($10^{10}m^3$)	76.2	14.8	22.8	65.8	62.2	951.3

2.4 Geographical scope (cont.)

(2) <u>Climate systems</u>

Climate of Jiangsu province and Shandong province belong to warm temperate zone half moist continent monsoon climate, four seasons distinct. South wind is popular in Summer of Shandong province and Jiangsu province is often attacked by typhoon. The average value of annual temperature of the two provinces is above 5 ℃. The annual precipitation value of Jiangsu province is about 1000mm, while 550-950mm of Shandong province.

The other three provinces belong to temperate continental monsoon climate with more drought and cloudy days in Spring and hot and rainy days in Summer. The winter days last longer than other provinces of China. Of the three provinces, annual precipitation of Liaoning province is most abundant with 600-1100mm.

2. Introduction

2.4 Geographical scope (cont.)

(3) Physical geography

The major relief of Jiangsu province, Shandong province and Liaoning province are hilly and plain regions, while mountanious regions cover a big proportion in the other two provinces. Besides, water area of Jiangsu province is quite large with 17% of the whole province.

The vegetation rate of Liaoning province，Heilongjiang province and Jilin province is separately 28.7% , 41.9% and 42.4%. Contrast with the three provinces, the vegetation rate of the other two provinces is much lower with 21.5% of Shandong province and 10.56% of Jiangsu province.

2. Introduction

2.4 Geographical scope (cont.)

(3) Physical geography (cont.)

Of the five provinces, Heilongjiang and Liaoning province is abundant in protected natural areas with a total number 84 and 81 separately, covering 2.3 million hectares occupying 5.05% area of whole province and 2.848 million hectares occupying 9.7% area of the whole province separately. Secondly, there are 66 protected natural areas in Shandong province covering about 6% area of whole province. At last, number of Jiangsu and Jilin provinces is relatively fewer with 26 and 27 separately covering 0.738 million hectares and 1.846 million hectares.

3. Social and economic situation in 2001-2002

3.1 Population, distribution of communities in the country

Geographical characteristics and economic situation of the main provinces in 2002

Province	Square,km^2	GDP per capita, USD/person	Population(million)
Jiangsu	100,000	2102	74.058
Shandong	150,000	1703	
Liaoning	150,000	1782	42.10
Jilin	180,000	1166	27.037
Heilongjiang	460,000	1453	38.15

3. Social and economic situation in 2001-2002

3.2 Industrial condition of major provinces(2002)

1) **The total added industrial value of Heilongjiang Province is 193.5 billion RMB, which had increased by 11.0% than last year. Heilongjiang Province is abundant in green food, which is the major industry in this region.**
2) **The total weath of society of Jilin Province by the end of 2002 is 1445.5 billion, among which the wealth from enterprises accounts for 70.1%. The preponderant industry of Jilin Province is resources exploitation and manufacturing industry, including petrol and natrual gas exploitation, tabacco manufacturing, black metal smelt, and transportation devices manufacturing ,etc.**
3) **The total industrial value of Liaoning Province of 2002 is 490.48 billion RMB, which had increased by 15.3% than the last year. The major industries of Liaoning Province are metallurgy industry, oil and petrifaction industry and electronics manufacturing industry, etc.**

3. Social and economic situation in 2001-2002

3.2 Industrial condition of major provinces(2002) (cont.)

4) The total added industry value in Shandong Province of 2002 is 350.2 billion RMB, which had increased by 17.3% than the last year. The added production value of heavy industry and light industry are 213.64 billion and 136.6 billion RMB separately. The branch industry includes petroleum and natural gas exploitation industry, food manufacturing industry, textile industry, chemical materials manufacturing industry, non-metal mineral manufacturing industry, and wiring manufacturing industry, whose production value account for the 54.8% of the total.

5) The added value of total industry production of Jiangsu Province in 2002 is 482.01 billion, which had increased by 14.0% by the last year. The added production value of heavy industry is beyond that of light industry, focused on textile industry, electronics industry, chemicals manufacturing industry, etc.

3. Social and economic situation in 2001-2002

3.3 Energy

The total energy consumption in 2002 is about 1.5 billion tons of coal, which has added 0.5 billion tons than that of 1990 with an average annual rate of 3.6%. Of which, coal occupies 66.3%, petrol occupies 23.5%, natural gas occupies 2.6% and water-electricity and nucleus energy occupies 7.6%.

Nearly 70% coals are not completely burned, which caused SO_2 and dust emission and led to acid rain finally. High grade energy such as petrol and natural gas occupied 33.7% of the whold energy consumpition in 2002, which has incresed by 9.9% than 1990. While, the energy consumption level is still lower than developped countries with the energy consumption each person is 156 KWh, which is only 7.7 % of Japan and 4% of USA.

4 . National monitoring and assessment activities

4.1 Marine monitoring

1)The offshore environmental monitoring network of the State Environmental Protection Administration conducts regular monitoring for two or three times every year in the offshore areas in the entire country except Taiwan Province, Hong Kong and Macao Special Administration Regions, mainly including more than 30 key areas and 300 stationary seawater quality monitoring sites in the offshore areas near cities, estuaries of rivers, key harbors, fishery areas and the marine areas with frequent human activities. In certain areas, monitoring on the sediments and the ambient biological quality is also conducted.

4 . National monitoring and assessment activities

4.1 Marine monitoring (cont.)

2) In 2002, two-phase seawater quality monitoring was carried out at 381 monitoring sites in 37 key offshore areas in the country, with 76 sites in Bohai Sea, 124 ones in the Yellow Sea, 122 ones in the East Sea and 59 ones in the South China Sea. The monitoring items include pH, DO, COD (alkali manganese method), oil, activate phosphate, nitrite nitrogen, ammonia nitrogen, inorganic nitrogen, non-ion ammonia, mercury, copper, lead and cadmium, altogether 14 ones.

4 . National monitoring and assessment activities

4.1 Marine monitoring (cont.)

3) The assessment of the marine water quality follows the Standards for the Ambient Seawater Quality (GB3097-1997). The Grade One seawater is suitable for marine fishery areas, marine nature reserves and reserves for endangered and rare marine species. The Grade Two seawater is suitable for aquaculture areas, swimming, marine sports or entertainment areas with direct exposure of human bodies to the seawater as well as industrial water sources areas directly related to human foods. The Grade Three seawater is suitable for normal industrial water sources, coastal tourist areas. The Grade Four seawater is suitable for coastal harbours and operational areas of the marine development.

4 . National monitoring and assessment activities

4.1 Marine monitoring (cont.)

4) The assessment methodologies of the seawater is single element index method, namely once any the assessment indicator in one certain monitoring site exceeds the standards for the Grade One Seawater, the water quality at that site is at Grade Two; if it exceeds the standards for Grade Two Seawater, the water is at Grade Three and so on.

4 . National monitoring and assessment activities

4.2 Surface water monitoring

4.2.1 National monitoring network of surface water's environmental quality

Monthly report of surface water quality: **the scope of the 7 key drainage areas' monthly report includes 571 surface water national monitoring stations, while 6 of them are involved in NOWPAP regions, that is Haihe River, Liaohe River, Yangtze River, Yellow River, Songhuajiang River.**

4 . National monitoring and assessment activities

4.2.1 National monitoring network of surface water's environmental quality

Monitoring items: **water temperature, pH, electrical conductivity, dissolved oxygen, index of permanganate, BOD_5, ammoniac nitrogen, oil, volatile hydroxybenzene, hydrargyrum, plumbum and flux(mainly analyzing the tendency of water quality variation).**

Monitoring time: from 1st to 10th every month; the date in May and in Octobor can be postponed until 15th.

The monitoring centre of drainage area monitoring network should compile drainage area water quality monthly report, and deliver it to China National Environmental Monitoring Center(CNEMC). The evaluation standard unifiedly adopts **"**surface water environmental quality standard (GB3838-2002)**"**.

4 . National monitoring and assessment activities

4.2.1 National monitoring network of surface water's environmental quality

CNEMC issues drainage area water quality monthly report in public through various media before 5th next month.
The range of the monthly report and the distribution of the monitoring spots
The range of the monthly report covers,Haihe River,Liaohe River, Yangtze River, Yellow River ,Songhuajiang River .

4 . National monitoring and assessment activities

4.2.1 National monitoring network of surface water's environmental quality

The water quality of rivers: Temperature, pH,Conductance,the dissolved oxygen, COD_{Mn}, BOD_5, NH_4—N, oils, the volatilized hydroxybenzene,Hg,Pb and the water flux, which include 12 items. The water flux is used for explaining the changing trend of the water quality. The water quality of lakes: Temperature, pH,Conductance,transparence, the dissolved oxygen, COD_{Mn}, BOD_5, NH_4—N,oil,the total phosphor,the total nitrogen,chlorophyll a, the volatilized hydroxybenzene,Hg,Pb and the water level, which include 16 items.(transparence and chlorophyll a are not for explaining the water quality ,but for the eutrophication of the lakes. The water level is for analyzing the changing trend of the water quality.)

4 . National monitoring and assessment activities

4.2.2 River water quality automatic monitoring station
From 1999 to 2002, 43 automatic stations has been set up in the important basins.
The distribution about automatic monitoring stations:Songhuajiang River 4, Liaohe River 5, Haihe River 7, Yellow River 10, Yangtze River 17.
Monitoring items:The analyzed items include water temperature (T), pH, dissolved oxygen (DO), electric conductivity (EC), turbidity (TB), chemical oxygen demand (COD_{Mn}), total organic carbon (TOC) and ammonium nitrogen (NH_3-N). total 8.

4 . National monitoring and assessment activities

4.2.2 River water quality automatic monitoring station
Monitoring frequency:The person managing the automatic system just can adjust the frequency. It could determine continuously and interrupted. Now, most stations analysis the water once per hour. So, we can obtain 24 data every day for each pollutant.
Data transportaion:The control center at CNEMC connected with substations through dialing modem and satellite. Data could through these tow ways from local station to CNEMC, and to SEPA.

4 . National monitoring and assessment activities

4.3 Methodologies and procedures

This part covers equipment used, detection limits and accuracy, QA/QC procedures. characteristics of network.

•The evaluation standard unifiedly adopts "surface water environmental quality standard (GB3838-2002)".

Table 4.2 The environmental quality criterion of the surface water（GB3838-2002）

Serial number	items	The analyzed method	Detective limit (mg/L)
1	temperature	Thermometor method	
2	pH	Glass electrode method	
3	the dissolved oxygen	Iodometric method	0.2
		Electric chemistry probe method	
4	COD_{Mn}		0.5
5	BOD_5	Dilution and seeding method	2
6	NH_4—N	Nessler's reagent colorimetric method	0.05
		Spectrophotometric method with salicylic acid	0.01
7	the total P	Spectrophotometric method with molybdenum acid ammonium	0.01
8	the total N	Alkali Potassium persalfate decomposed u;traviolet spectrophotometry method	0.05
9	Hg	Cold atomic absorption spectrophotometry	0.00005
		Cold atomic fluorescence method	0.00005
10	Pb	Atomic absorption spectrophotometry	0.01
11	the volatilized hydroxybenzene	After distillation by means of 4-AAP spectrophotometric method	0.002
12	oil	Infrared spectrophotometric method	0.01

4 . National monitoring and assessment activities

4.3 Methodologies and procedures

The evaluation standard of marine water quality in the offshore area adopts "marine water quality standard (GB3097-1997)".In it, there are four classifications: one classification of sea-water quality applys to the marine fishery water area, marine preserve and rare halobios closing to extinguishment zone; the second classification of marine water quality applys to aquafarm, sea-water baths, marine public places of sports or entertainment where people can touch the sea-water directly, and the industrial water-used area directly related to people's diet; the third classification of marine water quality applys to the normal industrial water-used area, coastal scenic resort; the fourth classification of marine water quality applys to water area of marine port and marine developing operation area.

Table 4.3 Sea water quality monitoring items and analytical method

Sequence number	item	unit	standard、regulation and code name（including publishing year）	uncertainty degree accuracy and limit
1	water temperature	(℃)	thermometry GB17378.4-1998(26.1)	（-5～40）℃
2	salinity	(‰)	salinometry GB17378.4-1998(30.1)	/
3	suspended dolid	mg/L	gravimetry GB17378.4-1998(28.1)	2mg/L
4	dissolved oxygen	mg/L	iodimetry GB17378.4-1998(32.1)	0.32mg/L
5	pH		glass-electrode method GB17378.4-1998(27.1)	0.02pH
6	active phosphate	mg/L	phosphomolybdic blue spectrophotometry GB17378.4-1998(40.1)	0.001mg/L
7	nitrogen nitrite	mg/L	1-amino-2-(α-naphthylamine)ethane spectrophotometry GB17378.4-1998(38.1)	0.001mg/L
8	nitrogen nitrate	mg/L	cadmium-column reduction method GB17378.4-1998(39.1)	0.003mg/L
9	ammoniac nitrogen	mg/L	indophic hydroxybenzene blue spectrophotometry GB17378.4-1998(37.1)	0.005mg/L
			hypobromite oxidation method GB17378.4-1998(37.2)	/
10	inorganic nitrogen	mg/L	GB17378.4-1998（36）	/
11	COD	mg/L	basic potassium periodate method GB17378.4-1998(33.1)	0.15mg/L
12	oil	mg/L	fluoresene spectrophotometry GB17378.4-1998(14.1)	4.5μg/L
			ultra-violet spectrophotometry GB17378.4-1998(14.4)	50μg/L
13	hydrargyrum	μg/L	cold atomic fluorometry "water and waster water monitoring and analytical method"	0.002μg/L
14	copper	μg/L	non-flame atomic absorption spectrometry GB17378.4-1998(7.1)	0.2μg/L
15	plumbum	μg/L	non-flame atomic absorption spectrometry GB17378.4-1998(8.1)	0.03μg/L
16	cadmium	μg/L	non-flame atomic absorption spectrometry GB17378.4-1998(9.1)	0.01μg/L

4 . National monitoring and assessment activities

4.4 Research activities and international cooperation

The cooperation project between China and Korea on Yellow Sea Environmental Cooperative Research during 1996-2004.

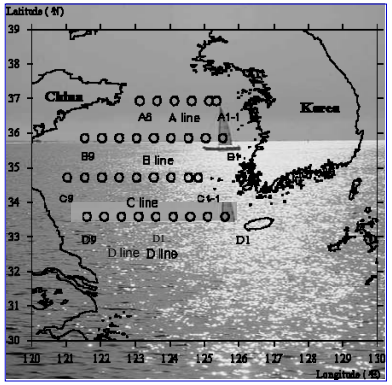
In 2002, a cooperative project "the technology on environmental protection and management of Olympic sailing boat venue and adjacent sea area" has been performed by Qingdao Environmental Monitoring Center, the First Institute Oceanography of State Oceanic administration and Ocean University of China. The project is ongoing successfully.

The special item on environmental research report of <<Clean Blue Sea Plan of Shandong Province>> has been compiled.

4 . National monitoring and assessment activities

4.4 Research activities and international cooperation

Sketch map of the sea area investigation scope and station in the Sino-R.O.K. Yellow Sea environment combined research



4 . National monitoring and assessment activities

4.5 Training activities

Technical training & forum on automatic monitoring of surface water: 3 times of training have been put up in 2002. The participator came from 42 automatic station and relative provincial monitoring center.

Technical training on the assessment of surface water: held in XinJiang on Sep. 23~25, 2004. The participator came from 31 provincial monitoring center and the monitoring center of 47 key cities.

Technical training on monitoring of red tide: held in Zhoushan in June,2004.The participators learned the technique and theory about red tide monitoring. The relative monitoring center improved the level of red tide monitoring.

QA/QC: the first proceeding on verification between laboratories of sea water monitoring had been fulfilled by CNEMC and the off-shore environmental monitoring center in Oct.~ Dec, 2004. The components are NO_3-N, NO_2-N, NH_3-N and active phosphate.

5. Present situation

5.1 Sea water

In 2002, the key pollution elements affecting the water quality in the offshore areas remain the inorganic nitrogen and activate phosphate. In some marine areas, COD, lead and oil far exceed the standards. In specific marine areas, copper, mercury and cadmium exceed the standard.

Yellow Sea: Grade I and II sea water account for 78.2%, 20.1% over that of the previous year. Grade IV and worse than Grade IV seawater accounts for 9.7%, 21.7% lower than that of the previous year. Inorganic nitrogen and activate phosphate are the major pollution elements affecting the offshore water quality in the Yellow Sea. Lead exceeds the standard in general, and in certain marine areas, COD, oil and copper exceed the standards.

5.1 Sea water

Table 5.1 the water quality statistics in Yellow Sea

Item	Samples number	Masymatic average	Measurements values	Over Grade I rate	Over Grade II rate	Over Grade III rate	Over Grade IV rate
DO	284	7.83	5.01~16.5	%	%	%	%
pH	289	8.09	7.34~8.80	5.2	5.2	0	0
COD	289	1.21	0.10~4.40	17.0	3.5	0.7	0
Oils	289	0.031	△~0.128	7.3	7.3	0	0
activate phosphate	284	0.014	△~0.312	25.7	2.5	2.5	1.4
NO_2-N	289	0.014	△~0.262	—	—	—	—
NO_3-N	289	0.077	△~0.684	—	—	—	—
NH_3-N	289	0.089	0.002~2.88	—	—	—	—
inorganic nitrogen	289	0.180	0.010~3.01	20.8	8.7	5.5	3.8
non-ion ammonia	181	0.0056	△~0.1347	4.4	4.4	4.4	4.4
Hg	168	0.006	△~0.020	0	0	0	0
Cu	224	2.61	△~24.0	12.5	2.7	0	0
Pb	235	1.38	△~6.80	53.6	0.4	0	0
Cd	174	0.087	△~1.70	0.6	0	0	0

Notes: the unit of heavy metal is μg/l, others are mg/l (ex. PH), △ means lower than detection limit.

5. Present situation

5.1 Sea water

Liaoning province: Grade I and II seawater accounts for 60.2%; Grade III seawater accounts for 7.7%; and Grade IV and worse than Grade IV seawater accounts for 32.1%. Compared with the previous year, the percentage of Grade I and II seawater increases by 8.1% and that of Grade IV and worse than Grade IV decreases by 9%.

5. Present situation

5.1 Sea water

Shandong province: the water quality in the offshore areas is fairly good, with Grade I and II seawater accounting for 78.2%, Grade III 12.0% and worse than Grade IV 9.8%. Compared with the previous year, the percentage of Grade I and II seawater increases by 13.2% and the percentage of the seawater worse than Grade IV decreases by 11.5%.

Jiangsu province: Grade I and II seawater accounts for 75.0%; Grade III seawater accounts for 6.2%; and Grade IV 18.8%. Compared with the previous year, the percentage of Grade I and II seawater increases significantly, with any seawater worse than Grade IV. Activate phosphate and inorganic nitrogen exceeds the standards on wide scale. In few key regions, lead, copper, COD, pH, cadmium and mercury exceed the standards.

5. Present situation

5.2 Surface water

In 2002, the water quality monitoring covered 379 sections in the surface water monitoring network, and 117 sections located on mainstream among of them. The key components are NH3-N, CODMn, BOD5, Oils, volatile hydroxybenzene(V-phen), Hg and Pb in the water quality assessment of river. And single factor assessment method is used for the water quality classification system, namely once any the assessment indicator in one certain monitoring site exceeds the standards for the Grade One surface water, the water quality at that site is at Grade II; if it exceeds the standards for Grade Two surface water, the water quality is at Grade III and so on. The over standard rate, over standard multiple and integrated pollution index are calculated depending on the 3rd grade of <<Environmental quality standard of surface water>>(GB3838-2002).

5. Present situation

5.2 Surface water

1) The water quality of Songhua River Valleys

In 2002, the water quality of of Songhua River Valleys is tolerable. In 36 monitoring sections on 14 rivers, 30.6% are with Grade Ⅲ, while 5.6% reached Grade Ⅱ and 25.0% reached Grade Ⅲ; 50.0% are with Grade Ⅳ-Ⅴ, while 44.4% reached GradeⅣ and 5.6% reached Grade Ⅴ; 18.9% reached Grade V plus.

Distribution of the water quality grade is mainly with Grade Ⅲ and Ⅳ, a little better than 2001. The water quality is fairly good in Ne River and the Seconde Songhua River, and Heilong River, Tumen River, and Songhua River follow according to the water quality. The water quality of branches is worse than other parts in the whole Valleys.Major pollutants are COD_{Mn} BOD_5.

5. Present situation

5.2 Surface water

Table 5.2 the water quality statistics in Songhua River Valleys in 2002

Component	Sections number	Sections number over standard	Annual average (mg/l)	
NH_3-N	36	4	0.001～10.833	
COD_{Mn}	35	23	2.43～35.52	
BOD_5	36	9	0.75～136.82	
Hg	29	2	0.00001～0.0002	
Pb	29	0	0.001～0.009	
V-phen	31	5	0.001～0.185	
Oils	23	9	0.002～1.018	

5. Present situation

5.2 Surface water

2) The water quality of Liao River Valleys

In 2002, the water quality of Liao River is after a sort. In 35 monitoring sections on 10 rivers including Yalu River, 7 sections are with Grade Ⅱ and Ⅲwith 20.1%, while 17.1% reached Grade Ⅱ and 3.0% reached Grade Ⅲ; 12 sections are with Grade Ⅳ-Ⅴ with 34.2%, while 17.1% reached Grade Ⅳ and Grade Ⅴ respectively; 16 reached Grade V plus with 45.7%.

The water quality of Yalu River is preferable in the whole Valleys. The water quality of Dalinghe is tolerable and no sections meet Grade Ⅲ. The water quality of Liao River and its branches is bad, while half of the sections are with Grade V plus, and Liao River is heavy polluted in Tieling and Shenyang. Big Liao River and its branches are heavy polluted, 66.7% of the sections are with Grade V plus, Hun River in Fushun and Shenyang, Taizi River in Anshan, Big Liao River in Yingkou are heavy polluted.

5. Present situation

5.2 Surface water

2) The water quality of Liao River Valleys

Table 5.3 the water quality statistics in Liao River Valleys in 2002

Component	Sections number	Sections number over standard	Annual average (mg/l)	
NH_3-N	35	19	0.083～20.82	
COD_{Mn}	33	21	2.3～299	
BOD_5	35	21	0.6～351	
Hg	25	3	*～0.27×10^{-3}	
Pb	21	0	0.001～0.20	
V-phen	26	9	*～0.072	
Oils	28	21	*～1.393	

Nontes: * means lower than detection limit.

5. Present situation

5.2 Surface water

3) The water quality of Huai River Valleys

In 86 monitoring sections on 65 rivers, 19.8% sections are with Grade Ⅱ and Ⅲ, while 7.0% reached Grade Ⅱ and 12.8% reached Grade Ⅲ; 36.0% sections are with Grade Ⅳ and Ⅴ, while 18.6% reached Grade Ⅳ and 17.4% reached Grade Ⅴ; 44.2% sections reached Grade V plus. According the proportion of different Grade of the water quality, the water quality in Jiangsu Province and Henan Province is better than An Hui Province and Shandong Province, no sections meets Grade Ⅲ in Shandong Province.

Major pollutants are NH3-N, BOD_5, COD_{Mn} and oils.

5. Present situation

5.2 Surface water

3) The water quality of Huai River Valleys

Table 5.4 the water quality statistics in Huai River Valleys in 2002

Component	Sections number	Sections number over standard	Annual average (m/l)	
NH_3-N	86	50	0.114 ~ 34.53	
COD_{Mn}	86	49	2.8 ~ 67.6	
BOD_5	86	53	1.0 ~ 118.4	
Hg	45	5	0.01×10^{-3} ~ 5.0×10^{-3}	
Pb	41	1	0.001 ~ 0.063	
V-phen	83	15	0.001 ~ 0.167	
Oils	73	42	* ~ 1.66	

Nontes: * means lower than detection limit.

5. Present situation

5.2 Surface water

4) The water quality of Hai River Valleys

In 2002, the water quality of Hai River is after a sort. In 55 monitoring sections on 35 rivers, 14.5% are with Grade Ⅰ ~ Ⅲ, while 3.6% reached Grade Ⅰ, 7.3% reached Grade Ⅱ and 3.3% reached Grade Ⅲ; 21.8% are with Grade Ⅳ and Ⅴ, while 14.5% reached Grade Ⅳ and 7.3% reached Grade Ⅴ, 63.7% are with Grade V plus.

5. Present situation

5.2 Surface water

4) The water quality of Hai River Valleys

Table 5.5 the water quality statistics in Huai River Valleys in 2002

Component	Sections number	Sections number over standard	Annual average (m/l)	
NH_3-N	55	37	0.028～39.40	
COD_{Mn}	55	34	1.2～201	
BOD_5	55	37	0.1～589	
Hg	51	13	0.01×10^{-3}～6.69×10^{-3}	
Pb	51	2	0.001～0.10	
V-phen	53	18	0.001～0.714	
Oils	55	39	0.01～1.14	

5. Present situation

5.2 Surface water

5) **The water quality of Yangtze River Valleys**

In 2002, the water quality of Yangtze River is fairly good. In 82 monitoring sections, 3.7% are with Grade I, 47.6% are with Grade Ⅱ, 24.4% are with grade Ⅲ; 14.6% are with Grade Ⅳ and Ⅴ, while 8.5% reached Grade Ⅳ and 6.1% reached Grade Ⅴ, 9.8% are with Grade V plus. The water quality is better than 2001 of Yangtze River Valleys, especially the mainstream, while 94.7% sections meet Grade Ⅲ, 12.6% upper than 2001. The water quality in of the branches is not as good as the mainstream.

5. Present situation

5.2 Surface water

5) **The water quality of Yangtze River Valleys**

Table 5.6 the water quality statistics in Yangtze River Valleys in 2002

Component	Sections number	Sections number over standard	Annual average (m/l)	
NH_3-N	82	13	0.010 ~ 22.70	
COD_{Mn}	82	5	1.3 ~ 8.7	
BOD_5	82	5	0.4 ~ 7.3	
Hg	76	4	* ~ 0.50×10^{-3}	
Pb	77	1	0.001 ~ 0.051	
V-phen	80	3	* ~ 0.020	
Oils	78	17	* ~ 2.04	

5. Present situation

5.2 Surface water

6) The water quality of Yellow River Valleys

In 2002, the water quality of Yellow River is after a sort. In 36 monitoring sections on 11 rivers, 8 sections are with Grade Ⅱ and Ⅲ with 22.2%, while 5.6% reached Grade Ⅱ and 16.6% reached Grade Ⅲ; 10 sections are with Grade Ⅳ and Ⅴ with 27.8%, while 22.2% reached Grade Ⅳ and 5.6% reached Grade Ⅴ; 18 sections are with Grade V plus with 50.0%.

5. Present situation

5.2 Surface water

6) The water quality of Yellow River Valleys

Table 5.7 the water quality statistics in Yellow River Valleys in 2002

Component	Sections number	Sections number over standard	Annual average (m/l)	
NH_3-N	36	18	0.055 ~ 19.15	
COD_{Mn}	36	11	1.4 ~ 174	
BOD_5	36	12	0.6 ~ 51.0	
Hg	28	6	0.01×10^{-3}~ 0.39×10^{-3}	
Pb	30	0	0.002 ~ 0.049	
V-phen	30	8	0.001 ~ 0.087	
Oils	32	24	0.01 ~ 6.85	

5. Present situation

5.3 Direct discharge Pollution Loads

The pollution loads from the main industrial plants that no-treated wastewater directly into the NOWPAP region .

Table 5.8 Direct discharge Pollution Loads in the NOWPAP region in China

District	Number of industrial plants in 2002	Amount of Direct discharge (10×10^4T)
Liaoning	139	311
Jiangsu	958	1049
Shandong	449	5233
Total	1545	6593

6. Proposals for future regional activities and priorities in NOWPAP regions

1. The capacity building of oceanic monitoring should be strengthened, some buoyage automatic station should be setup on the special sea area.

2. The relative country should use the uniform monitoring method and assessment standard, so the data from different country could be acceptable by all of the partners. The training on this kind of method & standard should also be held.

3. Some pilot project about the influence on sea water from the pollutants of the big river should be started.

7. Conclusion

Offshore Areas: Marine pollution in offshore areas has been mitigated. The main pollutants are inorganic nitrogen, active phosphate. The water quality is better in Yellow Sea and South China Sea than in the East China Sea and Bohai Sea.

Marine pollution in offshore areas is mitigated in 2002, 49.7% of sea water is grade with I and Ⅱ, while an increase of 8.3% occurred in comparison with the previous year. 35.9% of the total is grade with Ⅳ and Ⅳ plus, while the decrease of 10.5% occurred.

The main pollutants are inorganic nitrogen and active phosphate of the offshore area water quality with upper over standard rate. Some of pollutants such as oils, COD and lead exeeded the standard in parts of the sea area. Heavy metals such as copper, mercury and cadmium also exeeded the standard in some individual sea area.

7. Conclusion

The surface water: There is organic pollution issue in most river valleys. Water quality in Haihe River is contaminiated seriously. Water quality in branches of Yellow River, Liaohe River and Huaihe River are bad. The conditions are passable in Songhuajiang River and satisfactory in Yangtze River.

8. References

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- Chinese Cities Statistical Annuals (2001,2002,etc.)
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- Chinese Environmental gazettes (2001,2002,etc.)
- Environmental Quality Report of China 2002
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- China Environmental Statistical Annuals(2002)
- http://www.hlj.gov.cn; http://www.jilin.gov.cn; http://www.nen.com.cn; etc.

- Songhuajiang River

The national controlled spots :105
Monitoring the rivers :44
The spots in main tream :36
Planed monitoring spots :454

Appendix III

National Report of Republic of Korea on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in the NOWPAP Region

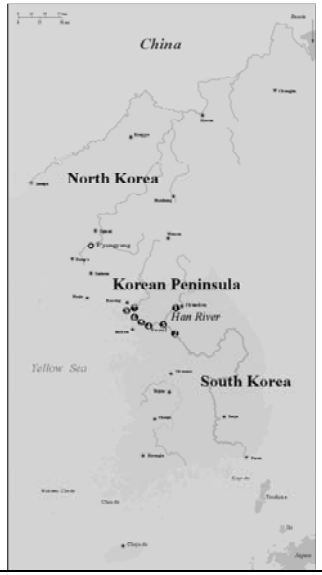
By National Expert of Republic of Korea

National Report of Korea

On River and Direct Inputs of Contaminants Into the Marine and Coastal Environment in the NOWPAP Region

October 2005

Geographical Outline of the NOWPAP Region



Republic of Korea

- **Land Area: 99,913 Km²**
- **Coastal Line: 12,051 Km**
- **Population(2002): 47,640,000**
- **Annual Precipitation: ca. 1,500 mm**
- **Annual Mean Temp.: 10-16℃**
- **Monthly Mean Temp.: 20-26 ℃ (August)**
  -5-5 ℃ (January)

Area and Coastline of Each Big Cities and Provinces

Big Cities and Provinces	Total area (km²)	Total coastline (km)
Seoul	606	0
Busan	763	314
Daegu	886	0
Incheon	987	954
Gwangju	501	0
Daejeon	540	0
Ulsan	1,057	136
Gyeonggi P.	10,183	357
Gangwon P.	16,874	318
Chungbuk P.	7,432	0
Chungnam P.	8,597	986
Jeonbuk P.	8,051	504
Jeonnam P.	12,046	5,540
Gyeongbuk P.	19,025	428
Gyeongnam P.	10,518	2093
Jeju P.	1,848	420
Total	99,913	12,051

Outline of Major Rivers (2002)

River	Basin Area (km2)	Length (km)	Annual Discharge Quantity (B m3)	Annual Average Precipitation(mm)
Han	25,954(35,770)*	494	189	1,301
Nakdong	23,384	510	138	1,186
Geum	9,912	398	66	1,272
Seomjin	4,960	224	39	1,412
Yeongsan	3,468	137	27	1,318
Ansungcheon	1,656	60	13	1,269
Sapgyeocheon	1,650	59	10	1,235
Mankyeng	1,504	81	10	1,254
Hyeongsan	1,133	63	6	1,138
Dongjin	1,124	51	8	1,278

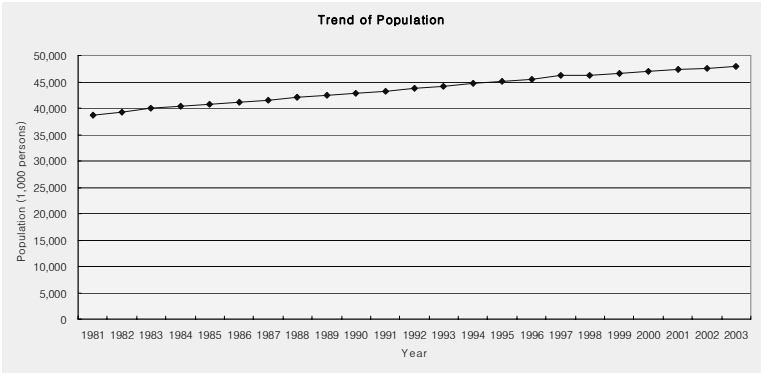
Comprehensive Water Quality Management Measures for the Four Major Rivers

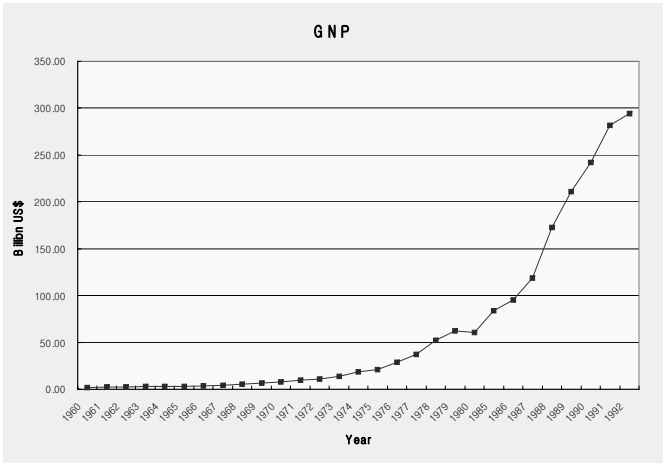
Grade Level Index

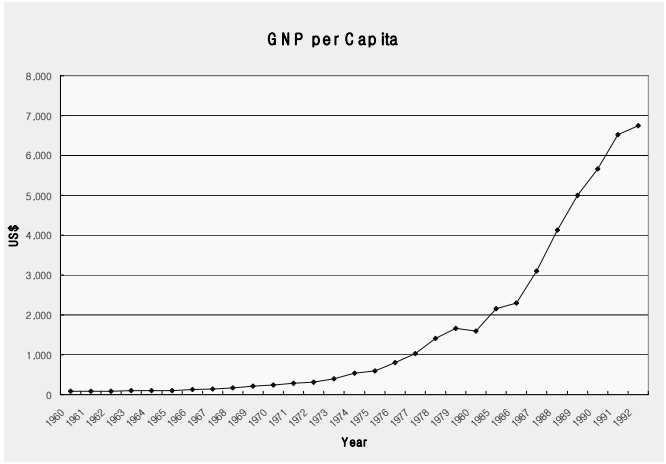
Grade Level	pH level	BOD(COD)	Suspended Solids	Dissolved Oxygen	Coliform Count	Total Phosphorous	Total Nitrogen
1	6.5~8.5	Below 1	Below 25	Above 7.5	Below 50	Below 0.010	Below
		<1>	<1>				0.2
2	6.5~8.5	Below 3	Below 25	Above 5	Below	Below 0.030	Below
		<3>	<5>		1,000		0.4
3	6.5~8.5	Below 6	Below 25	Above 5	Below 5,000	Below 0.050	Below 0.600
		<6>	<15>				
4	6.5~8.5	Below 8	Below 100	Above 2	-	Below 0.100	Below 1.0
		<8>	<15>				
5	6.5~8.5	10	No floating	Above 2	-	Below 0.150	Below 1.5
		(Below 10)	trash				

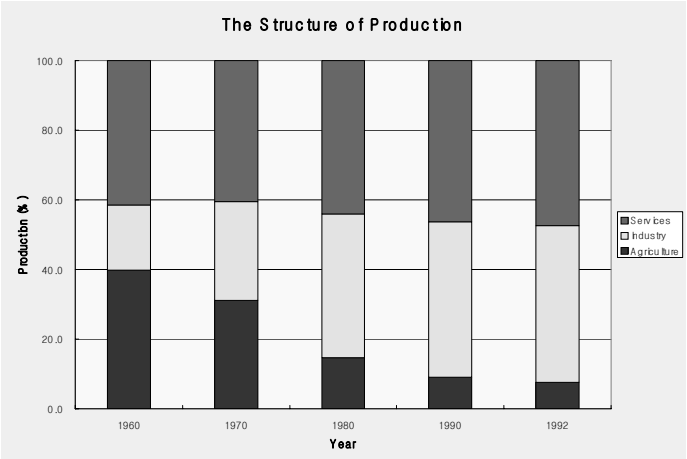
•Unit: mg/L for all except Colon Bacilli, MPN/100ml
•* BOD: indicator for streams, COD: indicator for lakes and marshes
•* < > and T-P, T-N apply to lakes and marshes

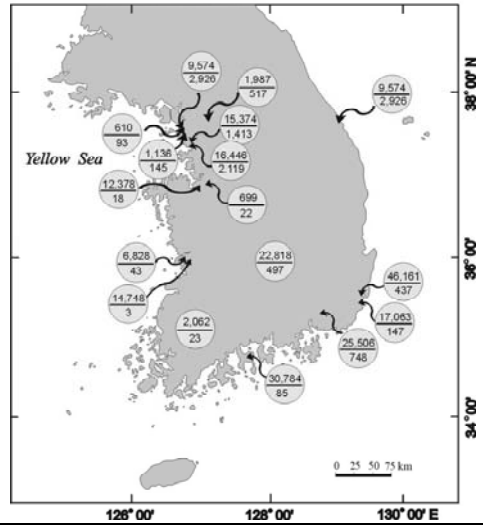
Social and Economic Situation in Recent Years




GNP
Billion US$
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1985 1986 1987 1988 1989 1990 1991 1992
Year

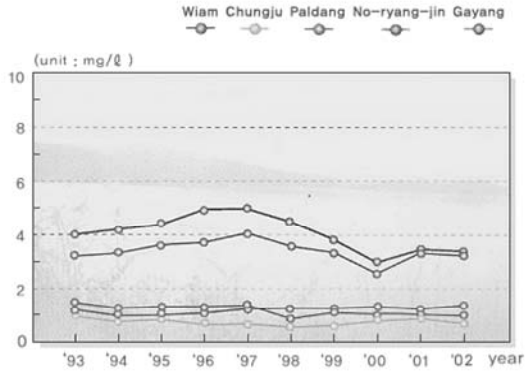

GNP per Capita
US$
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1985 1986 1987 1988 1989 1990 1991 1992
Year


The Structure of Production
Production (%)
100.0
80.0
60.0
40.0
20.0
0.0
1960
1970
1980
1990
1992
Year
Services
Industry
Agriculture


Industrial Complexes in Korea
Yellow Sea
9,574
2,926
1,987
517
9,574
2,926
610
93
15,374
1,413
1,136
145
16,448
2,119
12,378
18
699
22
6,828
43
22,818
497
46,161
437
14,748
3
17,063
147
2,062
23
25,506
748
30,784
85
0 25 50 75 km
126° 00'
128° 00'
130° 00' E
38° 00' N
36° 00'
34° 00'

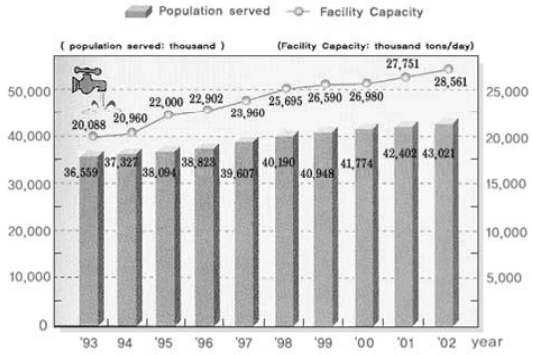
Current Status of Water Quality

BOD Trend (Han River)



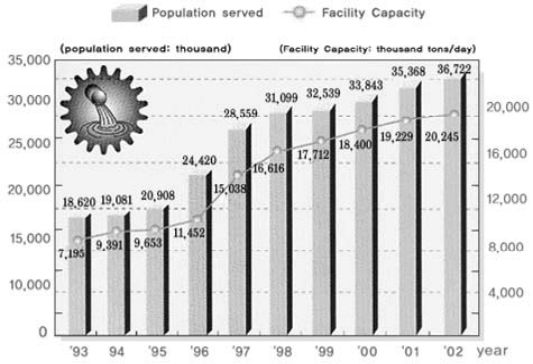
Water Supply and Sewage System

Supply of Drinking Water



Water Supply and Sewage System

Supply of Sewage Treatment



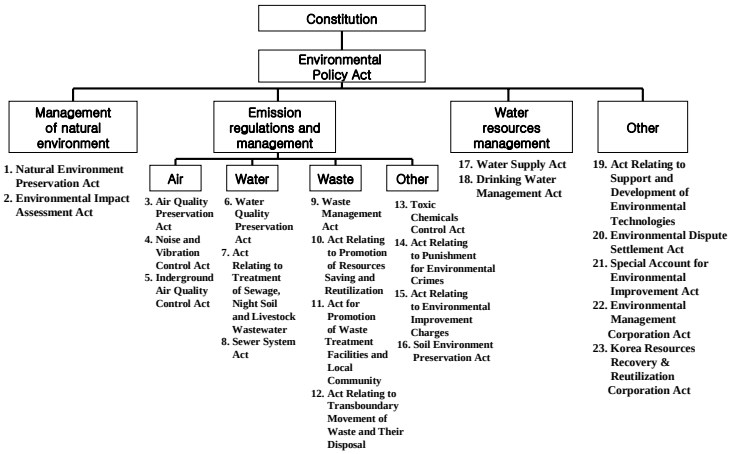
Overview of National Policies and Laws

Korea's Water Policy Goals

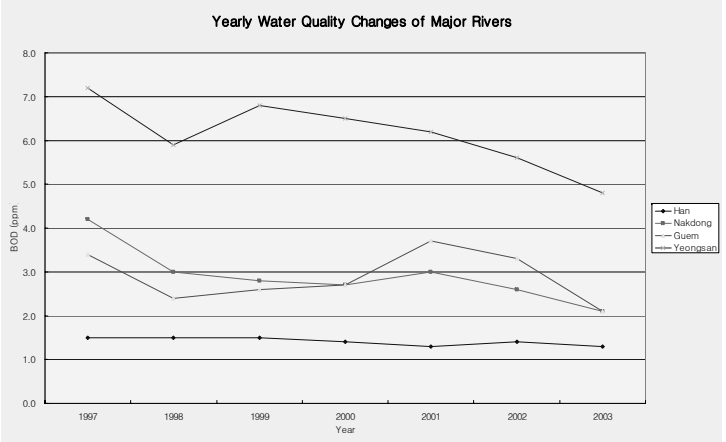
Korea's water management policies aim at securing the public right to clean and safe water, as ordained by:

- **Protect public health by securing clean and safe water supplies;**
- **Preserve water quality at all waterways & rivers while protecting water ecosystems;**
- **Create a healthy and pleasant waterside environment for our citizens.**

Environmental Laws



- **More than 50 environmental laws under more than 15 ministries**
- **Many efficiency and coordination related problems.**
- **As policy directions of different ministries may also differ, there may arise conflict and friction between ministries.**
- **To prevent such conflicts, close cooperation among ministries is essential for effective policy implementation**



Major Environmental Quality Standards

List of Environmental Quality Standards and Relevant Legislation

General Area	Specific Area	Relevant Legislation
Water Quality	Water quality standard (river, lake, underground water, marine water), drinking water standards, treated water standards, discharged wastewater standards	Basic Environmental Policy Act, Water Quality Preservation Act, Act Relating to the Treatment of Sewage, Nightsoil, and Livestock Wastewater
Soil and Toxic Chemicals	Waring standards and countermeasure standards on soil pollution, pollution standards on limiting harvest of agriculture and forestry products, standards on toxic chemicals	Soil Environment Preservation Act, Toxic Chemical Contraol Act

Major Environmental Quality Standards

Water Quality Standards

Cd	As	CN	Hg	Organic Phospho rus	Pb	Cr+6	PCB	ABS
< 0.01	< 0.05	Not Detected	Not Detected	Not Detected	< 0.1	< 0.05	Not Detected	< 0.5

Seawater Quality

Living Environment

Grade	pH	COD (mg/L)	DO (mg/L)	E. Coli (E. Coli/100ml)	O&G (mg/L)	T-N (mg/L)	T-P (mg/L)
I	7.8~8.3	≤1	≥7.5	≤1,000	≤0.01	≤0.3	≤0.03
II	6.5~8.5	≤2	≥5.0	≤1,000	≤0.01	≤0.6	≤0.005
III	6.5~8.5	≤4	≥2.0	-	-	≤1.0	≤0.09

Seawater Quality

Living Environment

Grade	Pollutant	Standard (mg/L)
All Seawater	Cr6+	0.05
	As	0.05
	Cd	0.01
	Pb	0.05
	Zn	0.1
	Cu	0.02
	CN	0.01
	Hg	0.0005
	PCB	0.0005
	Diazinon	0.02
	Parathion	0.06
	Malathion	0.25
	1.1.1-Trichloromethane	0.1
	Tetrachloromethylene	0.01
	Trichloromethylene	0.03
	Dichloromethane	0.02
	Benzene	0.01
	Phenol	0.005
	ABS	0.5

Pollutants Level for Ocean Dumping

Pollutants	Solid Phase (mg/l)	Liquid Phase (mg/l)
Oil & Grease	-	≤ 50
CN Compounds	≤ 1	≤ 1
Cr or Cr Compounds	≤ 2	≤ 20
Zn or Zn Compounds	≤ 5	≤ 90
Cu or Cu Compounds	≤ 3	≤ 15
Cd or Cd Compounds	≤ 0.1	≤ 1
Hg or Hg Compounds	≤ 0.005	≤ 0.05
Organophosphorus Compounds	≤ 1	≤ 1
As or As Compounds	≤ 0.5	≤ 5
Pb or Pb Compounds	≤ 1	≤ 10
Cr6+	≤ 0.5	≤ 5
F Compounds	≤ 15	≤ 200
Phenols	≤ 5	≤ 50

List and Schedule of Monitoring of Sea Water by NFRDI

		List of monitoring items	Monitoring schedule
Coastal area	General items (11)	pH, DO, COD, SS, Oils, Temperature, Salinity, Transparency, T-P (PO_4-P), T-N (NO_3-N, NH_3-N), *E-Coli*	4 times a year (February, May, August, November) PCB and Organic P: 1 time a year (August)
	Special items (10)	Cr^{+6}, As, Cd, Pb, Cu, Zn, CN, Total Hg, Organic P, PCB	
Offshore area	General items (11)	Same as in coastal area	Once a year (August)
	Special items (8)	Same as in coastal area except for PCB and organic P	

Number of sea watermonitoring stations and their levels

	Number of areas (Number of stations)			Number of stations in each level		
	Coastal area	Offshore area	Total	I	II	III
West	10(60)	2(18)	12(78)	51	20	7
South	35(130)	2(10)	37(140)	79	34	27
East	15(50)	2(12)	17(62)	31	16	15
Total	60(240)	6(40)	66(280)	161	70	49

Research Activities

- **Yellow Sea Large Marine Ecosystme (YSLME)**
- **Fate of POPs and EDCs in the Environment**
- **Developing/Improving Analytical Methods of Pollutants**
- **Research on New Emerging Pollutants : Fluorinated Cpds, PBDEs, etc**

Methodologies and Procedures

- **Standard Operating Procedures for Marine Environment (MOMAF)**
- **Standard Operating Procedures for Environment (MOE)**
- **SOPs of USEPA, International Organizations.**

National Laboratories

- **National Fisheries Research & Development Institute (NFRDI)**
- **National Institute for Environmental Studies (NIER)**
- **Korea Ocean Research & Development Institute (KORDI)**

Training Activities

- **NFRDI:**

Training for government officers, fishermen, and marine industry.
Basic and Professional Training Course, Fishermen Training Course, and Video Communicating Training Course

Training Activities

- **NIER**

As for the content of training, in fiscal year 2004, it is classified into 1) environmental administration, 2) environmental policy, 3) natural environment, 4) water management, 5) waste management, 6) environment management, and 7) environmental analysis.

Content of analysis training	
Instrumental Analysis	GC, UV, AAS, ICP
Analysis training	Atmospheric analysis, odor substances analysis, and water analysis
	Waste analysis and VOCs analysis
	Drinking water analysis
Endocrine disrupters analysis	
Dioxins environmental monitoring	
Toxic chemicals analysis	

Training Activities

▣ KORDI:

International training for APEC and PEMSEA developing countries for twice a year (3 weeks).

Analytical techniques of POPs, EDCs, Oil pollution, Nutrients and on board training

Financial support from APEC (central fund), MOST, and KOICA (Korea International Cooperation Agency)

Present Situation of Rivers and Direct Discharge of Pollution to the Marine Environment

Generation and Discharge of Waste Water by River Basin

	2001		2002		2003	
River	**Generation**	**Discharge**	**Generation**	**Discharge**	**Generation**	**Discharge**
Han	739	332	659	275	668	309
Nakdong	758	591	835	601	761	516
Geum	345	188	362	171	319	198
Yeongsan	28	22	39	27	42	24
Mankyeong	120	85	109	73	107	74
Seomjin	8	6	9	6	9	7
Ansungcheon	188	108	55	35	34	25
Sapgyocheon	28	17	60	25	53	25
Dongjin	19	10	19	10	20	10
Taewha	28	19	30	17	28	17
Nat'l Total	**7,907**	**2,555**	**7,966**	**2,442**	**7,972**	**2,363**

Night Soil Generation and Treatment

Year	**Night Soil**	**Night Soil Treatment Sludge**	**Total**
1994	10,735	31,844	42,579
1995	9,493	36,408	45,901
1996	8,411	37,543	45,954
1997	7,563	39,309	46,872
1998	6,589	40,573	47,162
1999	5,864	41,631	47,495
2000	5,202	42,186	47,388
2001	4,623	43,604	48,227
2002	3,984	44,511	48,494
2003	3,271	45,446	48,717

Discharge of Wastes at Sea

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
West	868	1,049	1,613	2,013	2,429	2,380	2,423	2,390	2,424	2,406
East-a	1,236	1,740	1,998	2,216	2,140	2,325	2,862	3,394	4,088	4,372
East-b	1,187	1,381	1,403	1,414	1,407	1,739	1,819	1,887	1,963	2,096
Total	**3,291**	**4,170**	**5,014**	**5,643**	**5,976**	**6,444**	**7,104**	**7,671**	**8,475**	**8,874**

•West: 200km west of Gunsan
•East-a: 125km east of Pohang
•East-b: 90km east of Busan

Waste Generation (2003)

(unit: tons/day)

Generation and Discharge of Waste Water by Industry

Year	Generation	Discharge
1997	**8,741**	**2,618**
1998	**4,067**	**2,614**
2001	**7,097**	**2,555**
2002	**7,966**	**2,442**
2003	**7,972**	**2,363**

Changes in the Amount of Waste Generated

(Unit: ton/day)

Categories	1994	1995	1996	1997	1998	1999	2000
Total Amount Generated	58,118	47,774	49,925	47,895	44,583	45,614	46,438
Recycled	8,927	11,306	13,085	13,907	15,566	17,394	19,167
Landfill	49,191	36,468	36,840	33,988	29,017	28,220	27,271
Amount Generated Per Person	1.33	1.07	1.11	1.05	0.96	0.97	0.98

Changes in Waste Treatment Methods

(Unit: %)

Categories	1994	1995	1996	1997	1998	1999	2000
Recycling	15.4	23.7	26.2	29	34.9	38.2	41.3
Incineration	3.5	4	5.5	7.1	8.8	10.2	11.7
Landfill	81.1	72.3	68.3	63.9	56.3	51.9	47

Appendix IV

National Report of the Russian Federation on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in the NOWPAP Region

By National Expert of Russia

National Report of the Russian Federation on River and Direct Inputs of Contaminants into the Marine and Coastal Environment in the NOWPAP Region

Vladivostok
2005

Table of contents

Goals and objectives:

- **to give an overview of national activities of the Russian Federation related to river and direct inputs of contaminants in the NOWPAP region, including organizations involved, institutional framework, research and management programs, which should be useful for the assessment of environment quality.**
- **to provide available information about concentration of some chemical substances in the river waters, to assess run off of contaminants by rivers, and to evaluate the direct input of contaminants to the coastal area due to sewages and storm water run off.**

Materials for this report were provided by the specialists of:

- **Pacific Geographical Institute (PGI), Far East Branch of the Russian Academy of Sciences (FEBRAS), Vladivostok**
- **Far Eastern Regional Hydrometeorological Research Institute (FERHRI), Vladivostok**
- **Primorsky Office on Hydrometeorology and Environmental Monitoring, Vladivostok and it's subdivision - Environmental Monitoring Center (EMC)**
- **Pacific Oceanological Institute (POI), Far East Branch of the Russian Academy of Sciences (FEBRAS), Vladivostok**

Background:

- One of five priority projects identified at the First Intergovernmental Meeting is NOWPAP/3, "Establishment of a collaborative, regional monitoring program". To oversee the implementation of NOWPAP/3, two Regional Activity Centers (RACs) were established in Toyama, Japan, and Vladivostok, Russia. Under the Pollution Monitoring Regional activity Center (POMRAC) in Vladivostok, two Working Groups were established: WG1 "Atmospheric Deposition of Contaminants" and WG2 "River and Direct Inputs of Contaminants". Members of both working groups are going to prepare the national reports and, later, regional overviews on these important environmental issues mentioned above.

General Information of River and Direct Input of contaminants:

Generally, the sources of river and marine water pollution are classified as domestic wastewater, industrial wastewater, and natural loads. The pollutant loads from these sources flow into the sea via the rivers running through urban and rural residential areas, industrial areas, and agricultural regions (the river input). Moreover, a part of the domestic and industrial wastewater, as well as natural loads enters directly into the sea (the direct input). The current situation with regard to river and marine water pollution sources is outlined in the following sections of this report.

Information on river input and chemical substances concentration in river waters will be done for the observation points situated much close to the river mouths without special attention to the processes obtained in the estuaries and mixing zone. Information on direct input of contaminants is based on official data about volume of municipal and industrial wastes and expert assessment of storm water runoff.

The Russian coastal area within NOWPAP region. 1-7 – sub-regions (districts) different by socio-economical and/or natural conditions described in Table 1

- **The region studied includes:**
- **1** – Khasanski district;
- **2** – Nadezhdinski district plus Vladivostok and Artem cities,
- **3** – Shkotovski and Partizanski districts plus Nakhodka and Fokino cities,
- **4** – Lazovski, Olginski and Kavalerovski districts,
- **5** – Dalnegorski district,
- **6** -Terneiski and part of Sovgavanski districts,
- 7 – south-western districts of Sakhalin Island

Table 1 Some characteristics of the coastal regions of Russian sector of NOWPAP area.

Regions	Square, $*10^3$ km^2	Shore line, km	Population $*10^3$ person	Population density, per./km^2	Volume of industrial production $*10^6$ USD	Volume of agriculture production, $*10^6$ USD	Volume of all production USD per capita
1	4.13	376	37.7	9.1	9.4	4.5	369
2	2.65	113	769.5	292.4	404.8	87.2	639
3	7.51	295	275.0	37.6	243.4	26.3	981
4	15.32	404	59.0	3.9	61.6	11.8	1244
5	5.34	18	50.4	9.4	50.8	4.3	1093
6	42.7	1119	73.8	1.7	54.9	2.9	783
7	15.64	767	117.8	7.5	215.6	18.1	1984
Total	93.29	3092	1383.2	14.8	1040.5	155.1	864

Overview of national policies and laws

- The FEDERAL LAW «ON ENVIRONMENTAL PROTECTION» (No. 7-FZ of January 10, 2002).

"...Environmental monitoring (state ecological monitoring) is a comprehensive system of observing the condition of the environment, assessing and forecasting of environmental changes resulted from natural and man-made factors... The state ecological monitoring is the environmental monitoring performed by the governmental bodies of the Russian Federation and the governmental bodies of the subjects of the Russian Federation".

Another legislative Act on this issue is The WATER CODE of the RUSSIAN FEDERATION (October 18, 1995).

The procedure of the state monitoring of water objects is established by the Government of the Russian Federation according to the Decision of the Government of the Russian Federation No. 177 of March 30,2003 « ON ORGANIZATION AND REALIZATION OF THE STATE MONITORING OF ENVIRONMENT (THE STATE ECOLOGICAL MONITORING) »;

Overview of national policies (continue)

- The water quality assessment in Russia is based on the compliance of the characteristics observed with so called maximum permissible concentrations (MPC). There are three sets of MPC in ambient water: (1) for the drinking water according to Sanitary Regulations and Norms (SanPIN 2.1.4.559-96); (2) for the water of domestic, drinking and cultural uses – "public waters"; (3) for the water used for the fishery purposes. All substances are divided for four classes of danger (toxicity level - TL) according to their toxicity for people and/or fish, cumulative and prolonged effects, etc: 1st class – extremely dangerous, 2nd class – high dangerous, 3rd class – dangerous, 4th – moderately dangerous.

- For the drinking water maximum permissible concentration is a hygienic norm obligatory without any exception. For some kind of "public" waters and waters used for fishery purpose maximum permissible concentration is an ecological norm, that is there is some possibility to exceed MPC with adequate deterioration of water quality.

Table. Some examples of maximum permissible concentration (MPC) of chemical substances (mg/l) in waters used for the different purposes

Parameter	Drinking	"Public" waters	Fishery purpose	TL
BOD5	nd	nd	2.0	4
COD	5.0 mg/l ($KMnO_4$)	5.0 mg/l ($K_2Cr_2O_7$)	15 ($K_2Cr_2O_7$)	4
PHC (petroleum hydrocarbons)	0.1 mg/l	0.1 mg/l	0.05	3
Detergents (Surfactants)	0.5 mg/l	0.5 mg/l	0.1	4
Phenols (summary)	0.25 mg/l	0.25 mg/l	0.001	3
Fe (summary)	0.3 mg/l	0.3	0.05*, 0.1	3/4
Cd (summary)	0.001 mg/l	0.001	0.005	2
Cu(summary)	1.0 mg/l	1.0	0.005*, 0.001	3
As(summary)	0.05 mg/l	0.05	0.01*, 0.05	2/3
Hg(summary)	0.0005 mg/l	0.0005	0.0001*, $<10^{-5}$	1
Zn (summary)	5 mg/l	1.0	0.05*, 0.01	3
Pb(summary)	0.03 mg/l	0.03	0.01*, 0.1	2
$N\text{-}NO_3^-$	10 mg/l	10	9.1	3
$N\text{-}NO_2^-$	0.75	0.8	0.02	2
$N\text{-}NH_4^-$	nd	1.0	0.4	3/4
HCH	0.002 mg/l	0.02	<0.00001	1
DDT (summary)	0.002 mg/l	0.1	<0.00001	2/1
PCBs	0.001	0.001	0.0001	1-2

Table. Some examples of water quality criteria based on concentration of chemical substances (mg/l)

Parameter	Type of water use	MPC	High pollution	Extremely high pollution
Mineralization	fisheries	1000	> 10000	> 50000
DO	fisheries		< 3.0	< 2.0
BOD5	fisheries	2.0	> 10	> 40
COD($K_2Cr_2O_7$)	fisheries	15	> 150	> 750
$N\text{-}NH_4^+$	fisheries	0.4	> 4.0	> 20
$N\text{-}NO_2^-$	fisheries	0.02	> 0.2	> 1.0
$N\text{-}NO_3^-$	fisheries	9.1	> 91	> 910
$P\text{-}PO_4$	fisheries	0.05	> 0.5	> 2.5
Zn	fisheries	0.01	> 0.1	> 0.5
Cu	fisheries	0.001	> 0.03	> 0.05
Cd	hygienic	0.005	> 0.015	> 0.025
Pb^{2+}	hygienic	0.006	> 0.018	> 0.03
PHC	fisheries	0.05	> 1.5	> 2.5
Detergents	fisheries	0.1	> 1.0	> 5.0
Phenols	fisheries	0.001	> 0.030	> 0.050
HCH, DDTs	fisheries	0.00001	> 0.00003	> 0.00005
H_2S	fisheries	0.00001	> 0.00010	> 0.00050

National programs

- The Federal Service on Hydrometeorology and Environmental Monitoring (ROSHYDROMET) is responsible for routine monitoring in Russia.
- In Primorsky Kray, monitoring of contamination of air, river waters, soil and marine environment is implemented by Primorsky Office on Hydrometeorology and Environmental Monitoring according to State Monitoring Programs.
- The municipal and industrial wastewaters are controlled by the subdivisions of Federal Service for Environmental, Technological and Nuclear Supervision.
- The quality of surface waters could be used as drinking water is controlled by the local authorities according to the standards (MPC) established by the State Office for Supervision on the Protection of Consumer's Rights and Human Welfare of the Ministry of Health and Social Development.
- Research activities in the field of quality and chemistry of surface waters are carried out by Institutes of the Far East Branch of the Russian Academy of Sciences (FEBRAS), by the Far Eastern Regional Hydrometeorological Research Institute (FERHRI), and other scientific organizations.

National Monitoring Program

- State Monitoring Program on the ambient water quality is implemented on the State monitoring network. The main criterion of water quality assessment is a compliance with Water Quality Standards: Maximum Permissible Concentration – MPC, which development and affirmation is a concern of State Office for Supervision on the Protection of Consumer's Rights and Human Welfare of the Ministry of Health and Social Development and State Fishery Service.
- The general objectives of State Monitoring Program in Russia are: 1) Observation on the water quality at the background (pristine) sites, and near the possible sources of contamination due to human activity as well; 2) Assessment and prediction (prognosis) of the water quality changes under the influence of the natural and human factors; 3) Provision the needs of state (governmental), business and human communities in the reliable information about ambient water quality and its changes for the subsequent use for the prevention/remediation of environmental damage.
- The water quality monitoring plan at the different monitoring sites is established according to the several criteria including population of watershed and significance for the biological resources.

Number of monitoring stations of different class in Primorsky Kray, parameters measured and frequency of observations

Number and Class of Station	Type and frequency of observation	Parameters measured
1, II	**Concise Program Type 2 (CPT-2), every 10 days**	**Hydrological parameters, visual observation, temperature, conductivity, DO, pH, SS, BOD, COD, an 2-3 characteristic pollutants**
19, III	**Concise Program Type 3 (CPT-3), every month**	**CPT-2 plus all characteristic pollutants**
13, IV	**Full Program, every hydrological phase**	**CPT-3 plus Eh, macro-ions, N-NH4, NO3, NO2, PO4, Fe, Si, oil products (PHC), PAH, trace metals, POPs**

Research activities: carried out by the institutes of Russian Academy of Sciences – Pacific Geographical Institute, Pacific Oceanological Institute, Institute of Water and Ecological Problems, and Regional Hydrometeorological Research Institute (FERHRI). Research cover assessment of river input of chemical substances, the human influence on the nutrients and metals concentration in fresh water, the assessment of storm and waste water run-off, the specific influence of mining industry on the fresh water, the behavior of chemical substances in the estuaries and in the mixing zone.

- **Training activities: Training of specialists of Primorsky Hydrometeorological Service is carried out in Moscow and Rostov-on-Don, at ROSHYDROMET central institutions. Depending on funds availability, training of specialists from China, Japan and Korea can be also organized.**
- **In research institutions, training is being done using "hands-on" approach, i.e. young researchers are being trained during field surveys, expeditions, laboratory experiments, etc.**

Present situation
Chemical composition of Primorsky Kray rivers flowing into the sea (average for 2002) .

Rivers	Water* discharge (m^3/s)	SS* (mg/l)	BOD_5 (mg/l)	COD (mg/l)	DO (mg/l)	Si (mgSi/l)
Tumen**	287	124	1.93	18.8	10.5	12.2
Tsukanovka	3.9	9.6	3.79	4.32	12.1	7.96
Razdolnaya	71.9	73	11.9	15.1	12.1	6.4
Artyomovka	4.9	38.7	1.94	7.76	11.4	5.7
Partizanskaya	42.0	38.7	2.2	6.7	11.7	3.9
Margaritovka	12.2	22.5	1.75	5.4	10.7	4.6
Avvakumovka	31.9	22.5	1.81	5.9	12.4	5.0
Zerkalnaya	17.5	22.5	1.28	5.4	11.5	4.0
Rudnaya	14.5	19.6	1.03	6.5	12.5	4.5
Serebryanka	16.4	21.7	1.4	4.3	11.8	5.3
Maksimovka	32.1	21.7	2.4	7.5	13.2	5.4
Samarga	89.9	21.7	0.7	9.0	13.4	5.3
MPC			*2.0*	*15*	*<3.0*	

Present situation
Chemical composition of Primorsky Kray rivers flowing into the sea (average for 2002) .(continue)

Rivers	NH_4 (mgN/l)	NO_2 (mgN/l)	NO_3 (mgN/l)	PO_4 (mgP/l)	Phenols (mg/l)	Sufract (mg/l)
Tumen	0.17	0.014	0.29	0.013	0.003	0.020
Tsukanovka	0.03	0.004	0.01	0.007	0.001	0.015
Razdolnaya	0.44	0.03	0.22	0.047	0.004	0.024
Artyomovka	0.03	0.003	0.01	0.006	0.001	0.008
Partizanskaya	0.02	0.004	0.01	0.003	0.001	0.012
Margaritovka	0.05	0.001	0.02	0.001	0.001	0.005
Avvakumovka	0.04	0	0.02	0.002	0.001	0.005
Zerkalnaya	0.08	0.003	0.05	0.034	0.003	0.014
Rudnaya	0.10	0.022	0.02	0.117	0.002	0.018
Serebryanka	0.07	0	0.12	0.002	0.002	0.005
Maksimovka	0.04	0	0.01	0.003	0.001	0.005
Samarga	0.05	0	0.08	0.002	0.002	0.016
MPC	***0.4***	***0.020***	***9.1***	***0.050***	***0.001***	***0.100***

Concentration of petroleum hydrocarbons (PHC, mg/l) and dissolved forms of metals (ug/l) in the rivers flowing into the sea in Prymorsky Kray

Rivers	PHC	Pb d	Cu d	Mn d	Fe d	Cd d	Zn d	Ni d
Tumen	0.02	0.14	1,82	115	75.3	0.030	1.14	0.63
Tsukanovka	0.01	0.037	0.44	5.6	11.5	0.025	0.21	0.14
Razdolnaya	0.04	0.023	1.27	14.9	23.7	0.012	0.36	0.80
Artyomovka	0.06	0.19	0.75	10	44	0.014	0.7	0.61
Partizanskaya*	0.07	0.19	0.075	10	44	0.014	0.7	0.61
Margaritovka*	0.03	0.19	0.05	10	11.5	0.014	0.21	0.14
Avvakumovka*	0.13	0.19	0,05	10	11.5	0.014	0.21	0.14
Zerkalnaya*	0.08	0.19	0,05	10	11.5	0.014	0.7	0.61
Rudnaya	0.04	0.64	1.35	110	21	0.25	120	0.8
Serebryanka*	0.04	0.037	0.05	5.6	11.5	0.025	0.21	0.14
Maksimovka*	0.01	0.037	0.05	5.6	11.5	0.025	0.21	0.14
Samarga*	0.08	0.037	0.05	5.6	11.5	0.025	0.21	0.14
MPC	*0.050*	*6*	*1*	*10*	*100*	*5*	*10*	*10*

Annual run-off of water (km3), nutrients, organic matter, petroleum hydrocarbons and phenols (tons) with rivers

River (Basins, area)	Water	PO_4	NO_2	NO_3	NH_4	Si	BOD5	OM	PHC	Phe-nols.
Tumen River	9,05	118	127	2625	1539	110410	17467	7685/ 74862	181	27,2
West Peter The Great Bay, (1)	0,8	6	3	8	20	6368	3032	1334/ 1514	10	0,8
Razdolnaya River, (2)	2,27	107	68	499	999	14528	27013	11886/ 15082	100	9,1
East part Peter The Great Bay, (3)	1,97	8	8	20	45	8156	4137	1820/ 5981	128	3,9
Primorsky coast area "south"(4)	3,67	11	7	73	206	16515	6239	2745/ 9043	128	3,7
Rudnaya River (5)	0,46	54	10	7	45	2070	474	208/ 1316	17	0,9
Primorsky coast area "north"(6)	21,7	43	22	260	977	104160	26040	11458/ 84022	282	21,7
Southwest Sakhalin coast (7)	3,33	123	nd	50	nd	12321	nd	nd	nd	nd
Total	43,25	469	245	3543	3830	274528	84401	37137/ 191819	847	67,3

Annual output of some dissolved metals (tons) with rivers from the Russian part of NOWPAP area*

River (Basins, area)	Pb	Cd	Fe	Mn	Cu	Zn	Ni
Tumen River	1,27	0,272	681,5	1040,8	16,5	10,3	6,6
West part of Peter The Great Bay	0,03	0,020	9,2	4,5	0,4	0,2	0,1
Razdolnaya River	0,05	0,027	53,8	33,8	2,9	0,8	1,8
East part of Peter The Great Bay	0,37	0,028	86,7	19,7	1,5	1,4	1,2
Primorsky coast area I	0,18	0,092	42,2	36,7	2,8	0,8	1,8
Rudnaya River	0,29	0,115	9,7	50,6	0,6	55,2	0,4
Primorsky coast area II	1,09	0,543	249,6	217,0	16,3	4,6	3,0
Southwest Sakhalinsky coast	nd	nd	68,9	27,3	3,3	57,9	nd
Total	3,29	1,096	1201,5	1430,4	44,1	131,2	15,0

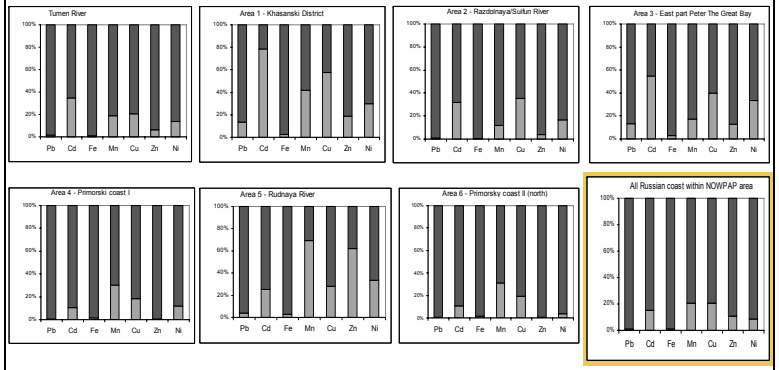
Note: * - annual output evaluated for averaged water discharge; nd – no data

Annual discharge of suspended solids SS, (thousand tons) and metals (tons) with rivers suspended solids from the Russian part of NOWPAP area*

River (Basins, area)	SS	Pb	Cd	Fe	Mn	Cu	Zn	Ni
Tumen River	1122,2	72,9	0,505	68679	4480	62,8	159,4	41,5
West part of Peter The Great Bay (1)**	7,7	0,2	0,005	363	6	0,3	0,7	0,3
Razdolnaya River (2)	165,7	7,0	0,058	8915	253	5,3	19,2	8,9
East part of Peter The Great Bay (3)	76,2	2,4	0,023	3095	95	2,2	9,5	2,4
Primorsky coast area I (4)	82,6	26,3	0,776	2593	85	12,1	117,3	13,5
Rudnaya River (5)	9,0	7,1	0,335	334	23	1,6	33,8	0,7
Primorsky coast area II (6)	470,9	150,2	4,426	14786	485	69,2	668,7	77,2
Southwest Sakhalinsky coast (7)	353,0	15,2	nd	13060	162	17,6	83,0	16,6
Total	**2287,3**	**281,4**	**6,1**	**111826**	**5589**	**171,2**	**1091,5**	**161,2**

* - avaraged for all period of observation, ** - number in brackets is region from Table 3.1

The role of suspended (purple) and dissolved (blue) forms of metals in the river runoff from Primorski Krai

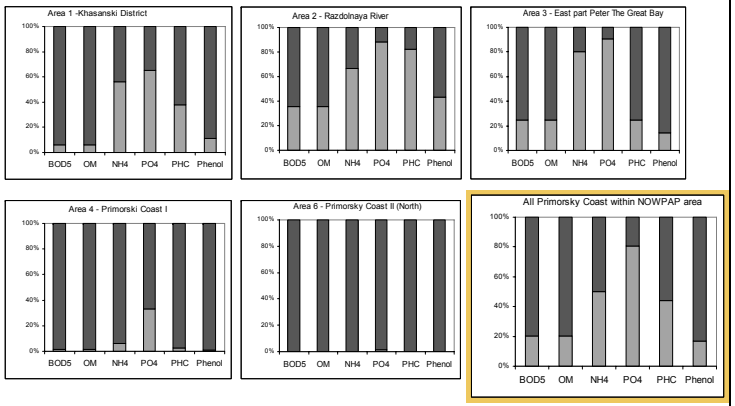


Summary annual input of some chemical substances (tons) with waste waters and stormwater wastes from the different districts of Primorsky Krai

Districts*	V*, 10^6 m^3	BOD5	OM	NH_4	PO_4	Sufractants	PHC	Phenols
Khasanski (1)	6,16	189	83	25	10,4	0,73	5,8	0,10
Vladivostok+Artem + Nadezhdinski (2)	484,4	14859	6536	1990	816,5	57,06	456,4	7,01
Shkotovski+Fokino +Nakhodka+Partizansk (3)	44,52	1366	601	183	75,0	5,24	41,9	0,64
Lazovski+Olginski +Kavalerovski (4)	3,22	99	43	13	5,4	0,38	3,0	0,05
Dalnegorski (5)	18,62	571	251	77	31,4	2,19	17,5	0,27
Terneiski (6)	0,42	13	6	2	0,7	0,05	0,4	0,01
Total	557,5	17101	7522	2291	939,6	65,67	525,2	8,07

V* - summary volume of wastes equal to official data corrected by increasing coefficient 1.22 plus 15% addition of storm water wastes according to Gavrilevski et al., 1998.

The role of river runoff (purple) and wastewaters (blue) in the input to the coastal waters of Primorsky Krai.



- **The comparison of river and waste run-offs allow to assess the role and significance of the anthropogenic influence on the fluxes of chemical substances from the land to the coastal waters. Taking in mind that some part of river runoff (for the Razdolnaya River first of all) includes anthropogenic material, such comparison will give the minimal evaluation of anthropogenic load.**
- **Obviously, that north part of Primorsky Kray coast with very low population has negligible anthropogenic influence on fluxes to the sea, and Peter The Great Bay has the maximum one.**
- **For the whole Russian mainland coast within NOWPAP region the anthropogenic flux of phosphate reaches up 80% of total river plus direct input of phosphor to coastal water.**
- **For ammonia and petroleum hydrocarbons the anthropogenic flux reaches up 50%. BOD5, oxidazable organic matter and phenols fluxes from anthropogenic sources form at least about 20% of total fluxes.**

Proposals for future regional activities and priorities in the NOWPAP region.

- The compilation and comprehensive joint analysis of the National Reports seems the one of the obvious regional activities on the river and direct input in the NOWPAP region. As a result the integrated Report will be compiled.
- However even now it is clear that some methodological features should be discussed and highlighted along with or after the preparation of integrated Report.
- First problem is a BOD5 and COD data compatibility. The participation of specialists from NOWPAP countries in the training courses could be one of opportunity to get over this gap. The special workshop after the preparation of integrated Report could be the next step in this field.
- The comparative assessment of the different parts within NOWPAP region from the point of view of nutrients and suspended solids input to the sea could be another issue for NOWPAP activity.
- For the effective monitoring of trans-boundary water bodies Russian experts suggest to establish monitoring stations at Tumen river and at Khanka Lake (Russia, China, DPRK).
- The participation in the regional program, namely "The Water Environmental Partnership in Asia (WEPA)" and "Network of Asian River Basin Management Organizations" (NARBO) would be very useful.

National priorities for the Russian Federation, related to River Inputs of contaminants in NOWPAP region include:

- re-establishing monitoring stations which were closed in recent years;
- monitoring of bottom sediment quality of rivers and lakes;
- increase of measured parameters (e.g., Hg, As, new pesticides).

The successful implementation of PDF-B activities of the proposed project "Addressing Land-based Activities that affect the Marine and Coastal Environment of the Northwest Pacific Region" needs to define the list of persistent toxic substances (PTS) of serious concern carried with river and direct inputs to the coastal environment of the NOWPAP region.

Conclusions, Executive Summary

- The current status on the concentration of chemical substances in river water and chemical substances run off is described with regard to pollution loads being discharged into rivers or directly into coastal environments from the Russian watersheds within the NOWPAP region, divided on several subregions according to their environmental conditions and socio-economical factors.
- The legislative base of water quality monitoring in Russian Federation, executive agencies, methods used, and water quality criteria are described in this report. Under the existing legislative base the Federal Service for Hydrometeorology and Environmental Monitoring is responsible for the monitoring of ambient waters, and State Office for Supervision on the Protection of Consumer's Rights and Human Welfare of the Ministry of Health and Social Development jointly with local authorities is responsible for the quality of drinking water. The scientific research organizations conduct a number of projects connected with different aspects of water quality monitoring. The main criteria of water quality is a compliance with maximum permissible concentration (MPC).
- The chemical characteristics of river waters in 2002 are presented as well as estimated runoff of chemical substances with rivers and wastewaters based on the official data and scientific research. The averaged annual runoff was 84,401 tons for BOD, 7617 tons for dissolved inorganic nitrogen, 469 tons for phosphate, and 2,287,300 tons for suspended solids. Runoff of metals is evaluated for dissolved and suspended forms separately. More than 80% of overall run-off of metals carried in solid phase. For such particulate bound elements as Fe and Pb, the role of particulate forms increase up to 98-99%.
- For the whole Russian mainland coast within NOWPAP region the anthropogenic flux of phosphate reaches up 80% of total river plus direct input of phosphate to coastal water. For ammonia and petroleum hydrocarbons the anthropogenic flux reaches up 50%. BOD5, oxidazable organic matter and phenols fluxes from anthropogenic sources form at least about 20% of total fluxes.

Pollution Monitoring Regional Activity Center of UNEP Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region (POMRAC NOWPAP)

Региональный Центр по мониторингу загрязнения окружающей среды Плана действия ЮНЕП по охране, управлению и развитию морской и прибрежной среды в Регионе северо-западной Пацифики.

Report of the 2nd Meeting of NOWPAP Working Group 1 - Atmospheric Deposition of Contaminants into the Marine and Coastal Environment

Vladivostok, Russian Federation
10-11 October 2005

Report of the 2nd Meeting of NOWPAP Working Group 2 - River and Direct Inputs of Contaminants into the Marine and Coastal Environment

Vladivostok, Russian Federation
10-11 October 2005

Материалы Второго Международного Совещания Рабочей Группы 1 (WG1) по атмосферному выпадению загрязняющих веществ в морскую и прибрежную среду региона Северо-Западной Пацифики (NOWPAP)

10-11 октября 2005 г., Владивосток

Материалы Второго Международного Совещания Рабочей Группы 2 (WG2) по речному и прямому поступлению загрязняющих веществ в морскую и прибрежную среду региона Северо-Западной Пацифики (NOWPAP)

10-11 октября 2005 г., Владивосток

(На англ. яз.)

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