第3回 韓中日 環境研究院長會合

The 3rd Tripartite Presidents Meeting among NIER, CRAES and NIES

May 16~18, 2006 / Jeju Korea

國立環境科學院(韓國) / 中國環境科學研究院(中國) / 國立環境研究所(日本)

NIER(KOREA)
國立環境科學院

CRAES(CHINA)
中國環境科學研究院

NIES(JAPAN)
國立環境研究所

The 3rd Tripartite Presidents Meeting

May 16~18, 2006 Jeju, Korea

NIER TPM3 Delegation

CRAES TPM3 Delegation

NIES TPM3 Delegation

Presidents with participants of TPM3 after signing ceremony

After signing Joint Communique of TPM3

Three presidents at the welcome dinner

Field Trip

At the Gosan Global Atmosphere Monitoring Site

At the O 'Sulloc Tea Museum

Ecologically restored Sanjicheon in Jeju City

preface

Preface

International cooperation is important in addressing transboundary and global environmental challenges beyond the control of any individual nation. In order to assure the “win-win” outcomes from the environmental cooperation, the three nations in Northeast Asia, namely, Korea, China and Japan, have organized a regular meeting of the Tripartite Environment Ministers Meeting (TEMM) in 1999.

The cooperative model stimulated the representative environmental research institutes of each country, that is, the National Institute of Environmental Research (NIER) of Korea, the Chinese Research Academy of Environmental Sciences (CRAES) of China and the National Institute for Environmental Studies (NIES) of Japan, to form a forum for environmental research cooperation. Thereafter, the three institutes have been holding the meeting taking turns for the last three years to promote environmental research cooperation in the region.

The first Tripartite Presidents Meeting (TPM) among NIER, CRAES and NIES was held in Beijing, February 2004. The three presidents, then, recognized the inseparable relationship among the local, regional and global environment, and discussed the measures to promote environmental research cooperation. At the TPM2 held in Tsukuba, Japan, in October 2004, the three presidents agreed to continue TPM and launched six cooperative environmental research projects in the areas of (1) Freshwater pollution, (2) Air pollution including vehicular sources, (3) Transboundary air pollution, (4) Yellow sand storm, (5) Hazardous materials

contamination such as endocrine disrupting chemicals and POPs and (6) Migratory birds and wetland.

The third TPM held in Jeju, Korea, from 15 to 19 of May this year, completes one round of the friendly annual meetings. We greeted the TPM delegations from CRAES and NIES led by President MENG Way and President OHTSUKA Ryutaro, respectively, as well as presenters for the 2nd International Workshop which was held to commemorate the TPM3.

The TPM3 was preceded by the workshop on Air Quality Management in Northeast Asian Countries that was hosted by Air Pollution Cap System Division at NIER. This was a good opportunity for the three institutes to learn how each nation developed measures to tackle the air pollution in and around big cities. Moreover, the participants reached a consensus on the necessity of the cooperation in the field of regional air quality control. Such cooperation will help the three countries in Northeast Asia to lessen the negative effect of rapid industrialization and urbanization in the region.

At TPM3, the partnership to improve the environmental quality of Northeast Asia through research cooperation was emphasized more than ever. It is therefore meaningful that the three institutes reached an agreement to exchange information, which includes the English language copies of annual reports, and the lists and the gist of major research projects. Moreover, the new initiative to facilitate participation of the kindred research institutes from the other countries in Northeast Asia, such as

North Korea, which was agreed upon at TPM3, is certain to promote cooperation for the region. President MENG Wei's kind expression, therefore, to try to invite an environmental research institute in North Korea as an observer to TPM4 was welcomed by the other members of the meeting.

It can be considered as a major breakthrough that the three institutes agreed upon initiating a joint research project to deal with the problem of "yellow sand storm" whose degree and extent is ever intensifying, threatening the environmental qualities in the region. The three presidents are expecting a feasible plan for the cooperation to be developed at the expert meeting in the autumn of 2006 in China.

The field trip to Global Atmosphere Monitoring Center at Gosan, the hillside on the western tip of Jeju Island, and to Sanjicheon, the ecologically restored stream that runs through the Jeju City, was a good opportunity for all the participants to realize again how the nature and environment can be affected by the selfish pursuit of convenience of mankind. We however were pleased to find out that we are in one mind to contribute toward the improvement of environment in Northeast Asia through this TPM.

After all the changes from inside and/or outside the three institutes have gone through recently, I believe that we now can write a new chapter on environmental cooperation based on the firm ground of mutual understanding and interest.

In conclusion, I hope that this record of TPM3 will be remembered by all the

participants and that the cooperative projects among the three institutes will soon take shape and bear fruits.

June 23, 2006

YOON, Seong-Kyu

President

National Institute of Environmental Research

Republic of Korea

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The 3rd Tripartite Presidents Meeting

The 3rd TPM Opening Address

YOON Seong-Kyu

President of NIER, Korea

Dr. Meng Wei, President of the Chinese Research Academy of Environmental Sciences (CRAES), Dr. Ohtsuka Ryutaro, President of the Japanese National Institute for Environmental Studies (NIES), distinguished participants, ladies and gentlemen.

On behalf of the National Institute of Environmental Research (NIER), I am pleased to welcome the delegates to the third Tripartite Presidents Meeting (TPM) in this beautiful Jeju Island.

Jeju Island is located at the heart of Korea, Japan, and China, and was last year designated as an Island of World Peace by the Korean government. Jeju landscape was formed by volcanic eruption. There are hundreds of secondary volcanoes. But all the volcanoes are extinct and you are perfectly safe here.

Mt. Halla (Hallasan) with a height of 1,950 meters has a crater lake, Baekrokdam, at its summit. Chonji at Mt. Baekdu (Baekdusan) in North Korea is another crater lake

in Korea. Korean has worshiped the two mountains with crater lake as the spiritual mountains for a long time.

The island has a mild oceanic climate throughout the year and retains its natural character. This unique environment adds the island's allure, making it a premier destination for world leaders, honeymooners. Last year, over five million tourists, including some four hundred thousand foreigners visited Jeju Island. This number of visitors is almost ten times that of Jeju inhabitants. All treasures of the island await you.

Recalling with pleasure, I appreciate CRAES initiative to hold the first TPM in Beijing in February 2004. Next I would like to thank NIES for hosting the second TPM, at Tsukuba in October 2004, which inaugurated our six joint projects.

As you know, the scale of our present environmental crisis has reached global proportions. The Yellow Sand Storms last month impressed on all of us how local deterioration in Northeast Asia may affect us all throughout the region. The same may be said for other environmental concerns such as acid rain, biodiversity conservation, migratory birds, and climate change. It is greatly hoped that TPM will play a constructive role in engaging and resolving these issues in our part of the world.

Yesterday as a part of the TPM we had a fruitful "International Workshop on Air Quality Management in Northeast Asian Countries." Its output may contribute to improving air quality in Northeast Asia.

Today we will explore various ways our institutes can more effectively implement joint projects in the areas of freshwater pollution, air pollution including vehicular sources, transboundary air pollution, yellow sand storms, hazardous materials contamination, and migratory birds and wetlands.

We will also discuss the recent reforms and research activities of our institutes with a view to increasing mutual understanding of the problems we confront and improving our collaborative efforts to surmount them.

NIER, CRAES, and NIES have successfully collaborated in advancing TEMM projects such as the pilot eco-village project in Inner Mongolia for ecological restoration of Northwestern China, the integrated management of freshwater quality for Lake Xihu in China, and the Joint Research Project on Long-range Transboundary Air Pollutants (LTP) in Northeast Asia.

We know last October the Seventh Tripartite Environment Ministers Meeting (TEMM) of China, Japan and Korea held in Seoul welcomed the progress of collaborative research promoted by the first and the second TPM.

In recognition of these achievements, we are grateful to President Meng Wei of CRAES and President Ohtsuka Ryutaro of NIES and their colleagues for their partnership and leadership. I would like to thank tripartite ministers for their concern on TPM.

In Korea as elsewhere in the region environmental problems are becoming more complicated and magnified. In response, our environmental policies have shifted from end-of-the-pipe control measures to precautionary and holistic approaches, such as establishing a Strategic Environmental Assessment applicable to policy, plan and program levels, promulgating special measures for Seoul metropolitan air quality improvement, and introducing the Total Maximum Daily Load Management System for water quality management.

In line with this policy shift, last July NIER was fundamentally reorganized to promote an inter- and multidisciplinary approaches to environmental problems. That process will be described in the first session of today's meeting.

The Korean government has been actively participating in international environmental cooperation. In March 2004 we hosted the 8th UNEP Special Session of the Governing Council and Environmental Ministerial Meeting in Jeju and in March 2005 in Seoul the 5th Ministerial Conference on Environment and Development (MCED) in Asia and the Pacific with environment ministers and 1,400 participants from 52 countries in attendance. In 2008 we will host the 10th Conference of the Parties to the Ramsar Convention on Wetlands.

Our three countries have traditionally shared a common culture of spirituality, to which a growing capacity for scientific and technical excellence may now be added. By working together, we have the opportunity to advance towards a cleaner, healthier,

more productive future.

Ladies and gentlemen, we stand at a crucial point in global efforts to protect and enhance the environment. I believe our three institutes can, should and will play an important role in this dynamic region by demonstrating sound leadership and solid achievements in environmental research and cooperation.

In closing, I would like to extend my deep appreciation to the delegates from the NIER, CRAES, and NIES. I wish you all the best for a very successful meeting and sincerely hope to meet with you again at next year's meeting in China.

Thank you!

TPM3 Keynote Address

OHTSUKA Ryutaro

President of NIES, Japan

Good morning, President YOON of NIER, President MENG of CRAES, and all distinguished participants. On behalf of all members of NIES, I would like to express our sincere thanks to President YOON and all colleagues of NIER for very nice arrangement and preparation of the TPM3. With your efforts, all of us enjoyed the workshop held yesterday and perhaps more importantly we have already been familiarized each other. Also I would like to say our deep appreciation to President MENG for his proposal of creating our TPM and for his and his colleagues' continuous leadership of, and contribution to, TPM.

Needless to say, environmental issues have been and will be increasingly more and more significant to be tackled and solved for safe and healthy life of humans and all organisms on the earth, particularly in the future. In Japan, the Council for Science and Technology Policy (within Japan Government's Cabinet) decided four prioritized fields in the Third Basic Plan for Science and Technology, which is effective from the fiscal year of 2006 to 2010: life science, information technology, environment, and nano-technology and materials. In my understanding, environmental researches

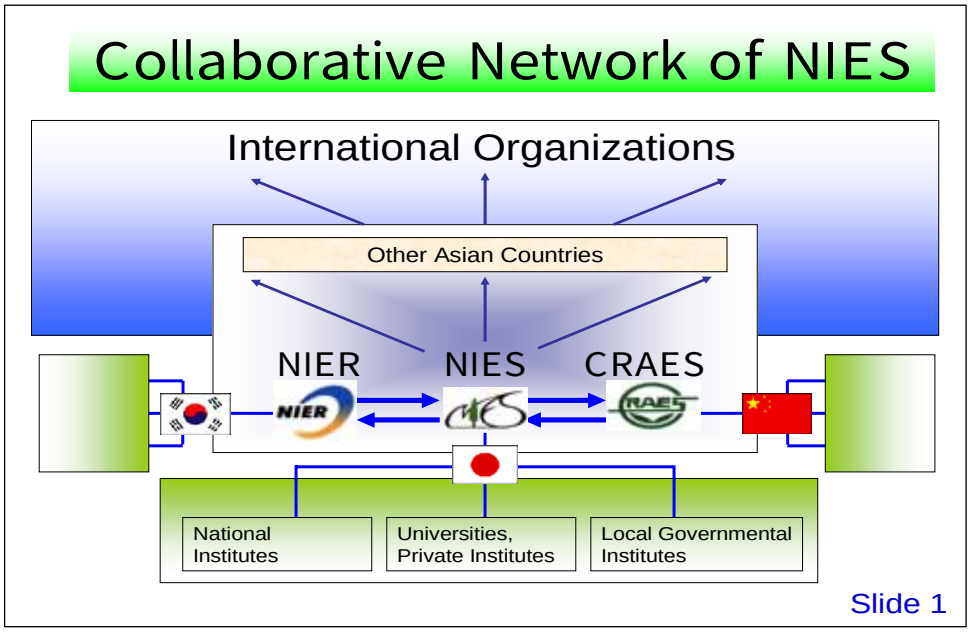
should be progressed in tight association with other three prioritized fields, playing the central roles in development of science and technology not only in Japan but also in Korea and China.

Considering environmental issues at the global level, it is important to note that Asia is a hotspot for three reasons. First, more than 60% of the world population inhabits Asia despite its land area of less than one fourth on the earth. Second, economic development has progressed rapidly, and will progress more rapidly, in Asian countries. Third, there is a high possibility of achieving an adequate level for sustainable development in Asia. For the last point, I would like to add some explanation. As stated by Dr. Amartya Sen, an Indian economist and a Novel Prize winner, Asian people, particularly those in East Asian countries, have long history of high-level public education and consequently their high intelligence make it easier to attain sustainable development.

Finally, I would like to point out two matters that are directly related to our collaborative activities in this meeting. The first is to develop network around our three institutes. As illustrated in Slide 1, the three institutes are expected to play leading roles of network, including each country's various institutes, universities and local governments on the one hand and, on the other hand, other Asian countries' governments and research institutes and many international organizations like UNEP and IPCC. In the second, my recommendations are (1) to confirm our previous agreement of promoting six research areas, although we do not deny addition of new areas, (2) to promote our practical collaboration for these research areas, considering

prioritization among them; air pollution, including vehicular sources, and yellow sand storm may be suitable areas to be pursued in this year and (3) to discuss about effective strategies for collaborative activities (Slides 1 and 2).

Thank you very much for your attention.



My recommendation (R. Ohtsuka, NIES)

1. Confirm our agreement of promoting six research areas, although we do not deny addition of new topics.

2. Promote our practical collaboration for these research areas, considering prioritization among them. Air pollution (including vehicular sources) and yellow sand storm may be suitable topics to be pursued in this year.

3. It is also important to discuss about effective strategies for collaboration.

Research Areas

	Have Been	Will Be
Freshwater pollution	○	
Air pollution, including vehicular s ources		○
Transbounday air pollution	○	
Yellow sand storm		○
Hazardous materials contamination, such as EDs and POPs		
Migratory birds and wetland		

TPM3 Keynote Address

MENG Wei
President of CRAES, China

Respected President Seong-Kyu Yoon , President Ohtsuka, ladies and gentlemen,

First of all, on behalf of the delegation from Chinese Research Academy of Environmental Sciences, all of our staff and in my own name, I would like to congratulate the opening of TPM3 on the beautiful Jeju Island. The meeting should have been held last November. However, it was postponed to be convened toady since I was so busy at that time. Here, I would like to express my profoundest apologies for that.

It is the third year since the establishment of TPM mechanism, and we are all pleased to notice that the mechanism has already enhanced the mutual understanding, cooperation and friendship among the three national environmental research institutes of three countries, which is of pioneering work. However, as times change, among Prof. Deok-Gil Rhee, Prof. Yohichi Gohshi and some other specialists and scholars, who have made foundational contributions to the setting up of TPM mechanism, some of them were retired or changed their duties that they are not able to be present here. Their contributions deserve our memory and thankfulness forever. Our joint

career continues to go ahead. Though it is the first time President Seong-Kyu Yoon and President Ohtsuka attend TPM, I have already seen their determination and will to promote the cooperation among the three sides. It is convinced that they will bring TPM with new ideas and spark.

Although, being countries in Northeast Asia, China, Japan and Korea have comparatively great difference in the national situation facing different environmental problems and pressure, the objectives of the three institutes' carrying out of environmental research are uniform, which is the basis for the joining up of us. Taking the responsibility of environmental science researchers, we should conduct experiment and study in allusion to key national and regional environmental problems to expatiate mechanisms of environmental pollution, to develop technologies controlling pollution discharge, transportation and transformation and to provide evidence and support for the decision-makers' constitution and implementation of effective management policies. The same regional geographic location puts ahead of us problems of sand storm, pollutant transportation, valley, ocean environment, biodiversity and migratory birds. There are so many regional environmental problems, on which common interest is attached, for us to cooperate with each other. I am willing and eager to advance the collaboration actively.

During the last two decades, China's social economy is developing rapidly, causing more complex and grim environmental problems, which take on features of time compressed, problem integrated and prominent pollution characters discrepancy. The valley water environment, urban atmosphere and other aspects are confronted with

great environmental pressure. In 2005, CRAES implemented science and technology system reform, making necessary adjustment of the research institution, with system of contractual employment being put into practice fully. More emphasis is attached on the research and constitution of environmental standard, with scientific research on the total control method of valley and urban contaminant completed.

To be frank, compared with NIER and NIES, CRAES is still relatively weak in the academic level of certain research fields, so that we should learn from NIER and NIES by dint of the platform built by TPM. Learning from NIER and NIES of the experience in scientific research management and administrative operational management is also required.

As far as I know, the Ministry of Environment, Republic of Korea, has done highly effective and fruitful work in the environmental protection, with NIER providing the technical support. It is of the same case that NIES provides technical guarantee for the Ministry of Environment, Japan, in its exertion of the important government function. Vice versa, the MOE and MOEJ offer NIER and NIES great support on the scientific research respectively. Therefore, I hope that CRAES would go on intensifying the communication and cooperation with NIER and NIES, since CRAES should also provide SEPA with more effective technical support. It is expected that the idea would gain understandings and support from both President Seong-Kyu Yoon and President Ohtsuka.

Finally, I would like to wish TPM3 a great success!

Session 1 Presentations

Brief Introduction to All New NIER

2006. 5. 17 LEE Jong Chun (李鍾天)

The 3rd Tripartite Presidents Meeting

National Institute of Environmental Research

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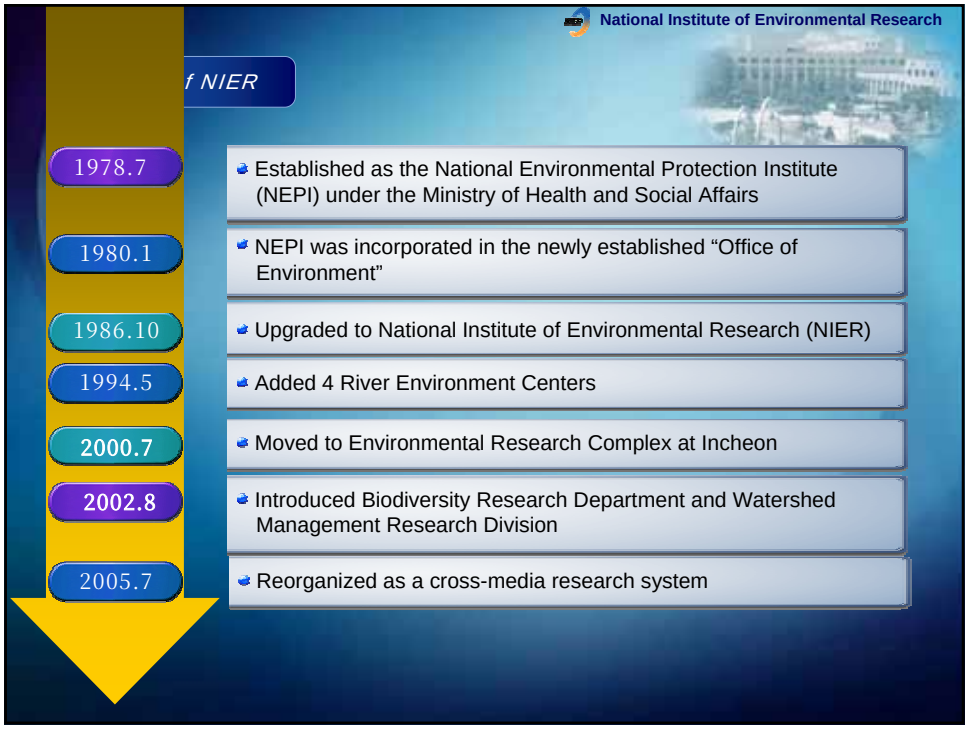
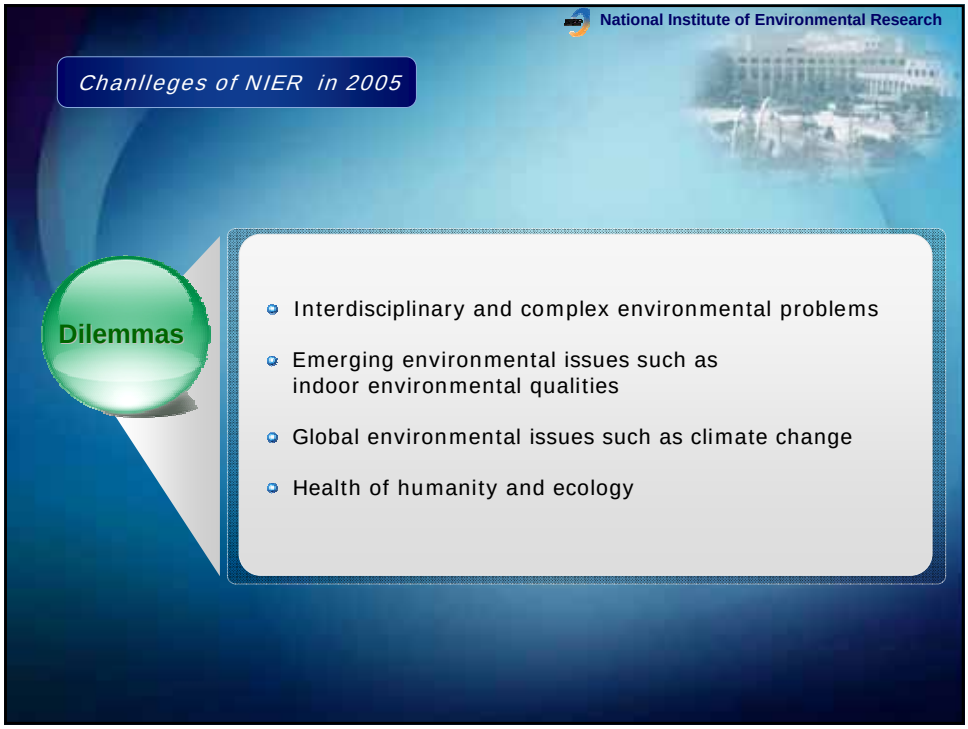

National Institute of Environmental Research
f NIER
1978.7
Established as the National Environmental Protection Institute (NEPI) under the Ministry of Health and Social Affairs
1980.1
NEPI was incorporated in the newly established “Office of Environment”
1986.10
Upgraded to National Institute of Environmental Research (NIER)
1994.5
Added 4 River Environment Centers
2000.7
Moved to Environmental Research Complex at Incheon
2002.8
Introduced Biodiversity Research Department and Watershed Management Research Division
2005.7
Reorganized as a cross-media research system


National Institute of Environmental Research
Chanlleges of NIER in 2005
Dilemmas
Interdisciplinary and complex environmental problems
Emerging environmental issues such as indoor environmental qualities
Global environmental issues such as climate change
Health of humanity and ecology

National Institute of Environmental Research

Before the Reform

President

Environmental Risk Research Department
- Environmental Risk Assessment Division
- Environmental Epidemiology Division
- Micropollutants Division

Biodiversity Research Department
- Biological Resources Division
- Plant Ecology Division
- Wildlife Biology Division

Air Quality Research Department
- Air Pollution Engineering Division
- Atmospheric Chemistry Division
- Atmospheric Physics Division
- Noise and Vibration Division

Water Environment Research Department
- Wastewater Engineering Division
- Water Chemistry Division
- Watershed Management Research Division
- Water Microbiology Division
- Drinking Water Division

Resource Recycling Research Department
- Waste Treatment Engineering Division
- Waste Chemistry Division
- Waste Resource and Recycle Division
- Soil Environment Division

Environmental Training Department
- General Affairs Division
- Environmental Training Division

- **General Affairs Division**
- **Research Innovation Planning Division**

- **National Traffic Environment Laboratory**
- **4 River Environment Research Laboratories**
  Han-River, Nakdong-River, Geum-River, Yeongsan-River

Lack the capability to tackle new issues

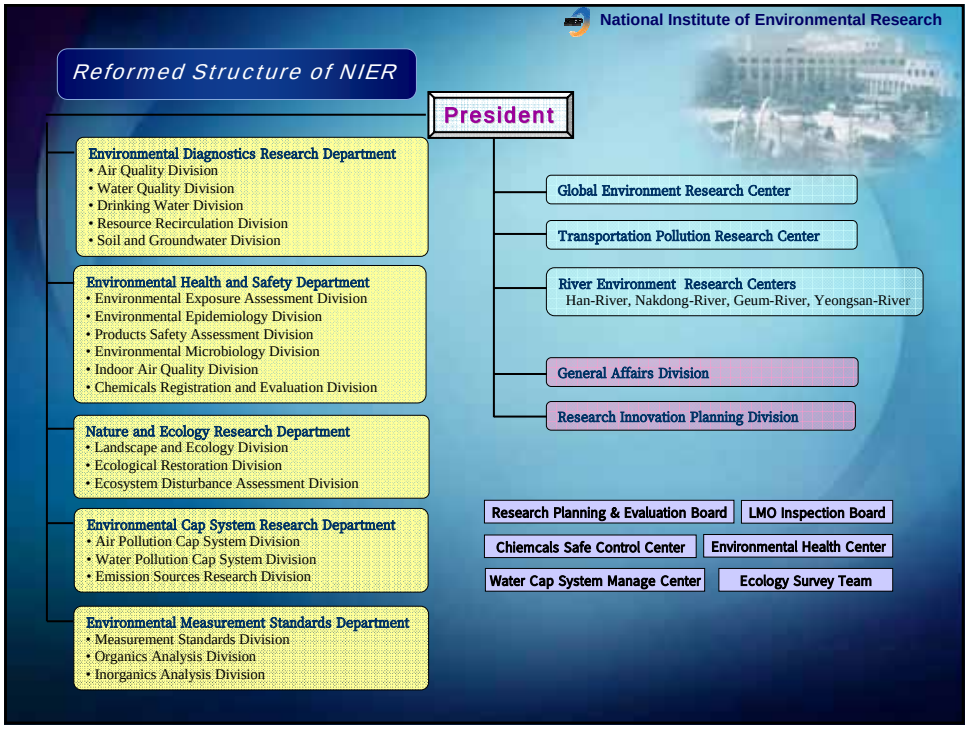
- Interdisciplinary and complex environmental problems
- Emerging environmental issues such as indoor environmental qualities
- Global environmental issues such as climate change
- Health of humanity and ecology

National Institute of Environmental Research

Challenges of NIER in 2005

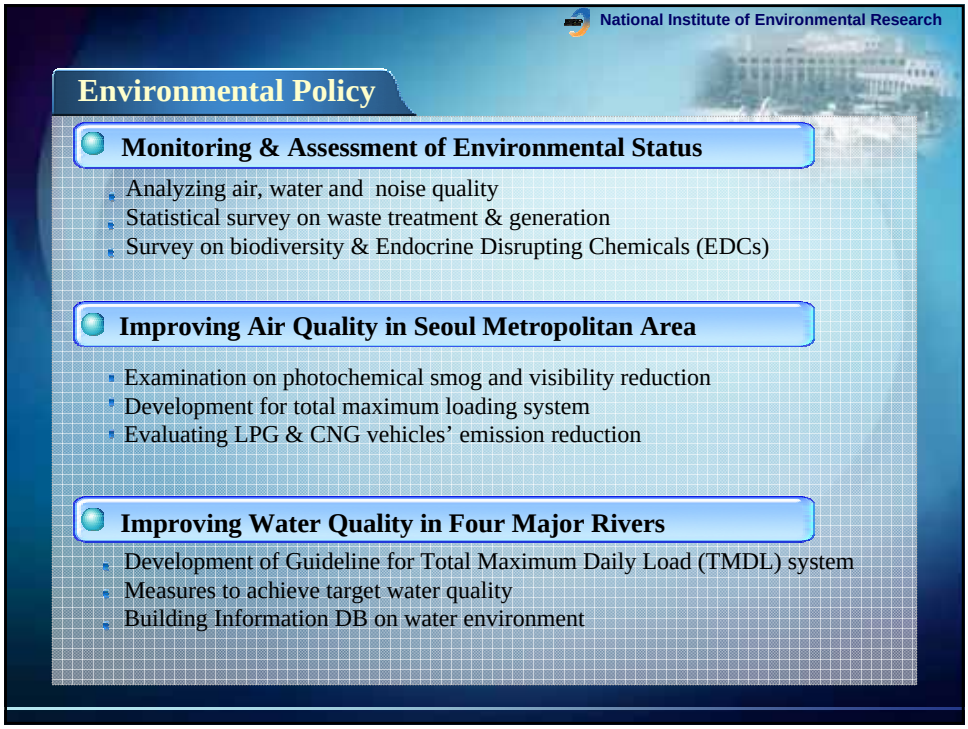
World's Leading Environmental Research Institute
Caring for the People of Korea

Organization	Personnel Management	Research Planning	Evaluation
Rigidity → Adaptability	Seniority → Competency	For Researchers → For Endusers	Subjective & Descriptive → Objective & Outcome based
▪ Cross-media Dept. ▪ 國立環境研究院 ➤ 國立環境科學院 ▪ New Divisions	▪ Open-door Competition ▪ Expertise respected ▪ 360° Evaluation	▪ Technical Roadmap ▪ Outcome-oriented ▪ Application for PM	▪ Std procedure ▪ Transparency ▪ Incentives


National Institute of Environmental Research
Reformed Structure of NIER
President
Environmental Diagnostics Research Department
• Air Quality Division
• Water Quality Division
• Drinking Water Division
• Resource Recirculation Division
• Soil and Groundwater Division
Environmental Health and Safety Department
• Environmental Exposure Assessment Division
• Environmental Epidemiology Division
• Products Safety Assessment Division
• Environmental Microbiology Division
• Indoor Air Quality Division
• Chemicals Registration and Evaluation Division
Nature and Ecology Research Department
• Landscape and Ecology Division
• Ecological Restoration Division
• Ecosystem Disturbance Assessment Division
Environmental Cap System Research Department
• Air Pollution Cap System Division
• Water Pollution Cap System Division
• Emission Sources Research Division
Environmental Measurement Standards Department
• Measurement Standards Division
• Organics Analysis Division
• Inorganics Analysis Division
Global Environment Research Center
Transportation Pollution Research Center
River Environment Research Centers
Han-River, Nakdong-River, Geum-River, Yeongsan-River
General Affairs Division
Research Innovation Planning Division
Research Planning & Evaluation Board
LMO Inspection Board
Chiemcals Safe Control Center
Environmental Health Center
Water Cap System Manage Center
Ecology Survey Team


National Institute of Environmental Research
Mission and Principles of NIER
Mission
Improving the quality of life through advanced environmental research
Major Principles of NIER Research
• Future Oriented : based on Environmental Risk Studies
• Meet the need of the endusers : general public, MOE
• Encourage practical and applicable research
• Reward for performance


National Institute of Environmental Research
Four Major Categories of Tasks
Environmental Policy
Supporting scientific background for environmental policy
Standards Setting
Setting up environmental standards and guidelines
NIER
International researches and information management
Environmental Information System
International Cooperation
Infrastructure


National Institute of Environmental Research
Environmental Policy
Monitoring & Assessment of Environmental Status
Analyzing air, water and noise quality
Statistical survey on waste treatment & generation
Survey on biodiversity & Endocrine Disrupting Chemicals (EDCs)
Improving Air Quality in Seoul Metropolitan Area
Examination on photochemical smog and visibility reduction
Development for total maximum loading system
Evaluating LPG & CNG vehicles' emission reduction
Improving Water Quality in Four Major Rivers
Development of Guideline for Total Maximum Daily Load (TMDL) system
Measures to achieve target water quality
Building Information DB on water environment

National Institute of Environmental Research

Environmental Issues

Reduction Measures of Environmental Risk

- Chemical accident response information system
- Management method of **EDCs** and management of toxic chemicals
- **Health impact** assessment in industrial complexes

Measures for Biodiversity Conservation

- National survey of the natural **ecosystem**, wetlands and caves
- Conservation of **wildlife** species, habitats, wetlands and biodiversity
- National Biological Resources Center ('02-'06, 48 M$) under construction

Improvement of Standard of Living

- Investigation of noise level, **indoor pollution** and magnetic fields
- Strengthening researches on "**Indoor Environment**"
- Virus monitoring of **drinking water** and algal blooming in water resources

Systematic Management of Hazardous Wastes

- Reduction methods and emission standards of **dioxins** from incinerators
- Improvement of the assessment methods in **landfill** areas
- Treatment criteria for handling organic **wastes**

National Institute of Environmental Research

Standards Setting

Improvement of Environmental Standards

- Parameters monitoring of **VOC** and organic compounds in major rivers
- Guidelines development for **water quality standards**
- Monitoring of **hazardous air pollutants**

Reinforcing Emission Standards

- Establishing **HAPs**, offensive odor, and vehicles emission standards
- Strengthening **wastewater** effluent standards
- Improving **drinking water** quality standards

Improving Analytical Methods and QA & QC

- **QA/QC** for analysis of pollutants and equipments
- International authorization for test & analysis
- Establishing "Environmental Measurement Standards Department"

Development of Technical Rules and Guidelines

- Measurement and inspections of **standard operating procedures**
- Disposal methods and analysis of PCBs and dioxins
- Guidelines for alien animals and **GMOs** management

National Institute of Environmental Research

International Cooperation

Long-range Transboundary Air Pollutants

- Monitoring of air pollutants over Northeast Asia with China and Japan
- Surveying health impact of yellow sand and EANET monitoring
- 8th LTP Meeting ('05 Jeju)

North East Asian Centre for Environmental Data & Training

- Participation from China, Japan, ROK, Mongolia, Russia, and DPRK
- Mitigation of Transboundary Air Pollution from Coal-Fired Power Plants (ADB, $450,000) & **Nature Conservation Project** (ESCAP, $370,000)
- 11th SOM ('05.11, Korea)

Lake Water Quality Improvement (TEMM Projects)

- Development of West Lake (Xihu) water quality management system
- Joint workshop on freshwater (lakes) pollution prevention ('05)

Other Cooperative Projects

- Exchange experts with Asia-Pacific countries
- Korea-China (Health Risk Assessment), KO-Japan, KO-Russia Projects
- Restoration of ecosystem in the Southeast Asian Tropical Region

National Institute of Environmental Research

Statistics of NIER

Staff	Total	Researching Staff	Administration	Technical Support
	274	201 (PhD: 105)	24	49

Budget in MUSD	2005	2006
Total	35	38
Research	11	11.8
Labor Cost	11	12
Maintenance	13	14
Information Infra	0.6	0.8

Examples of **Research Projects of NIER, 2006**

Environmental Diagnostics Department

- **Acid deposition** monitoring and impact assessment
- Study on the monitoring system for **hazardous substances in the polluted water**
- Management of **geosmin and 2-MIB in drinking water**
- Establishment of hazardous characters assessment and management system in **specified wastes**
- Establishment of **soil pollution standards** on organic pollutants

Environmental Health and Safety Department

- Environmental **risk assessment** of brominated flame retardants
- A study on **mercury exposure** level and health effects
- A study on **management system of products** containing hazardous substances
- Suitability study of **bacterial water quality standard** candidate
- A time series survey on variations in concentration of **indoor pollutants at new apartments** in Korea

Nature and Ecology Research Department

- **Indicator species for climate change** impact assessment in Korean Peninsula
- A study on the migration route and protective management plan of **migratory birds**
- A study on detailed survey on **invasive alien species** in Korea and designation of invasive alien species on foreign countries

Environmental Cap System Research Department

- An establishment of **air polutants allocation standards for the air emission facilities** in accordance with air pollutants cap system
- Assessment method for **treatment effect of pollutants as a reuse of rainfall runoff**
- A study on the structure and performance evaluation of a **pyrolysis and melting system**

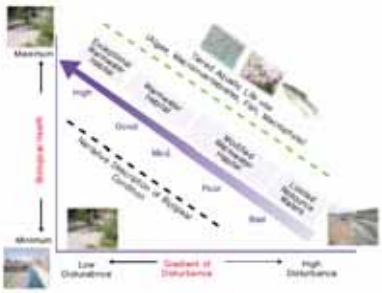
Environmental Measurement Standards Department

- A study on the analytical method and generative mechanism identification of **PBDDs/DFs from stationary emission sources**

Brief Introduction to Major Research Areas at NIER

Integrated Water Quality Assessment Methods Reflecting the Ecological Conditions

- Objective
  - Securing and maintaining of soundness of water ecosystem
- Ecological status classes using Indicator Organisms
  - water quality classified by indicator organisms
  - extension of water quality class and adjustment of criteria
- Development of Eutrophication Assessment Method
  - correlationship among Chl-a, COD, TP
  - develop eutrophication indices optimized for Korea
- Sediment quality guidelines
  - Criteria based on pollutants, ecology, management purposes



Securing Pleasant and Healty Indoor Air

- Objectives
  - To protect human health and prevent environmental hazard and harm from indoor air
- Emission test for building materials
  - source of formaldehyde and VOC : wallpaper, flooring, paints and adhesives
  - Sick House Syndrome
  - tested using small chamber method (picture)

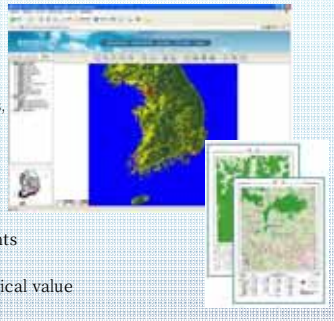
Small chamber method

- Time series research on concentration of indoor pollutants at apartments
  - to characterize indoor air quality
  - carried out before residents move in a new apartment or public buildings

Brief Introduction to Major Research Areas at NIER

Monitoring National Ecosystem

- Objective
  - to protect natural scenic beauty and endagered animals and plants
- National Ecosystem Survey
  - The third survey from 2006 to 2013
  - Budget: 26 MUSD
  - Categories: landforms, vegetation, flora, birds, mammals, amphibia, reptiles, freshwater fishes, insects, benthic macroinvertebrates

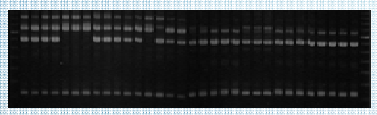


- National Maps of Evosystem and Nature (picture)
  - thematic maps of nation's natural environments graded by their ecological characteristics
  - classified into 1st, 2nd, 3rd according to ecological value

Conservation and Restoration of Endangered Wildlife

- Objective
  - To conserve and manage some 220 endangered species protected by the Wildlife Protection Act
- Restoration of Endangered Wildlife
  - Asiatic black bears: released into nature after adaptation training
- Restoration of Endagered Wild Plants

Asiatic black bear



PCR analysis of gene of *Echinosophora koreensis* showing big genetic differences from other regions

Echinosophora koreensis

Brief Introduction to Major Research Areas at NIER

Establishment of Advanced Basin Management for TMDL(Total Maximum Daily Loads)

- Objectives: advanced basin management system for the control of basin outflow within a target water quality, requring scentific support such as water quality modeling
- Regions: 4 major rivers in Korea
- Technical Support System for TMDL
  - provide systematic and scientific information on masin management
  - simulate water quality modeling in establishing a TMDL plan

Technical support system of TMDL management

Brief Introduction to Major Research Areas at NIER

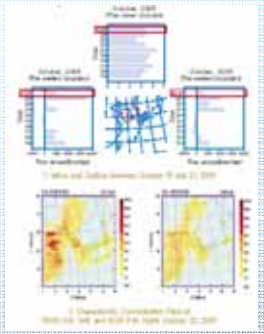
Air Pollutants Monitoring System for Environmental Conservation in Northeast Asia

- Objective:
  - understand the present air quality levels through a cooperative measurement among Korea, China and Japan

- Monitoring of long-range transboundary air pollutants
  - surface monitoring D/B for air pollutants
  - aerial meaurement mainly carried out above the Yellow Sea

Airplane for aerial measurement

- Modeling of long-range transboundary air pollutants
  - modeling of air pollutants for transfer, conversion and deposition to estimate transpoundary fluxes of air pollutants



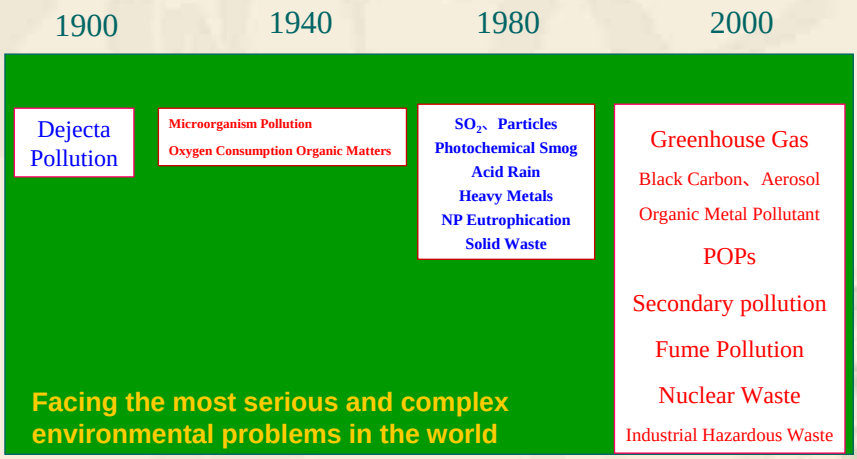
Main Contents

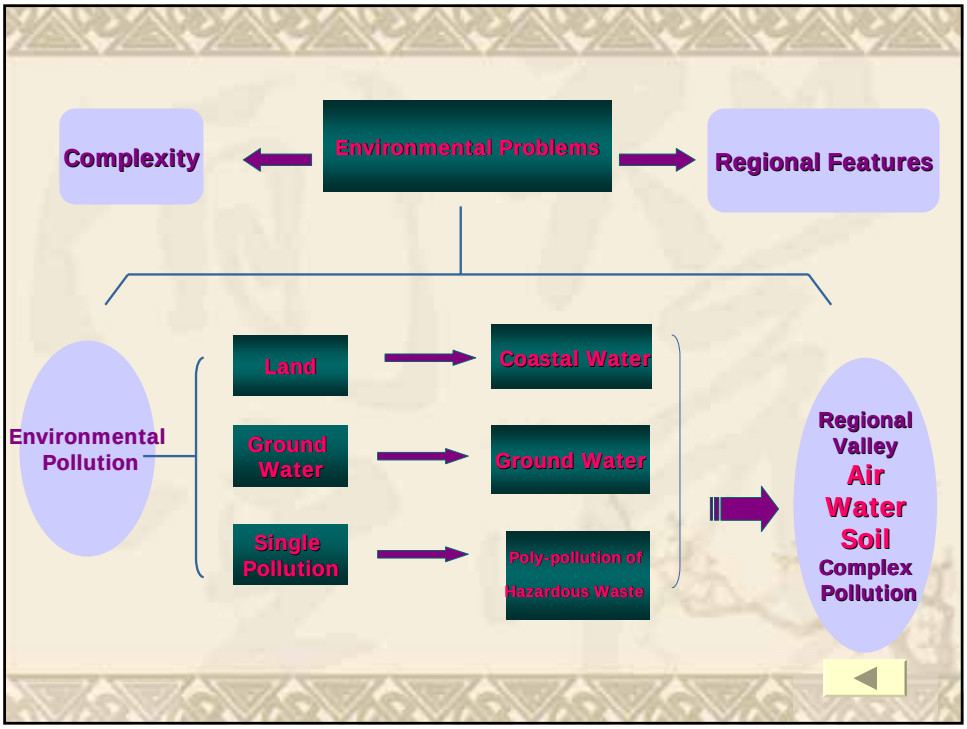
1. Environmental Pollution's Character in New Period
2. Environmental S&T's Development Trend
3. Environmental S&T's Demand
4. Environmental S&T's Strategic Guideline and Action
5. Environmental S&T's Strategic Research Field
6. Guarantee Measurements of Environmental Sciences' Development Strategy

1.1 Environmental Pollution's Characteristics in China

- **Ecological destroy and degeneration is expanding from local scope to larger range of ecological degeneration and complex environmental pollution.**
- **The environmental problems become serious from simplex industrial pollution to industrial, agricultural and living pollution combined complex situation, with problems of regional ecology, atmosphere, water and soil interweaved, putting up prominent complexity and regional characteristics.**
- **The ongoing exasperated environmental situation makes the ecosystem and human health endangered. Environmental pollution borne loss is as much as 3-8% of GDP.**
- **The International Convention and International Green Barrier is the challenge to conquer.**
- **The global environmental change pricks up China's ecology and environmental deterioration.**

Original Environmental Problems and New Pollutions Co-existing





1.2 Current Situation of China's Environmental Pollution

Economy continues to increase rapidly

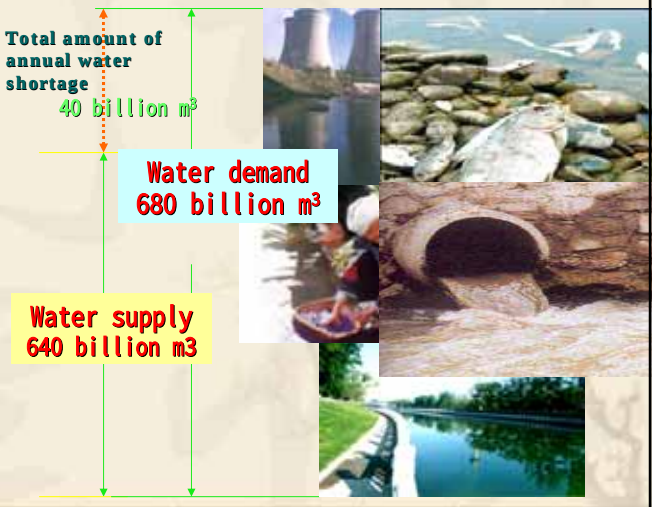
Fragile ecological environment

Ecological Environmental Problems are getting more and more serious

- **Comparatively short of resource and energy. Austere ecological environment situation**
- **The discharge amount of "Three Wastes" increased year by year**
- **Worrying about Water environmental safety**
- **Aggravated urban air pollution**
- **Pollution of solid waste towards air, water and soil is getting more and more serious day by day**
- **The phenomenon of noise disturbing citizens is worsened**
- **Serious non-point agricultural pollution in countryside, threaten food safety**
- **Prominent "modern environmental health risk"**
- **Serious ecological deterioration**
- **Hidden trouble of nuclear and radiation**

Short of Water Resource,Serious Pollution

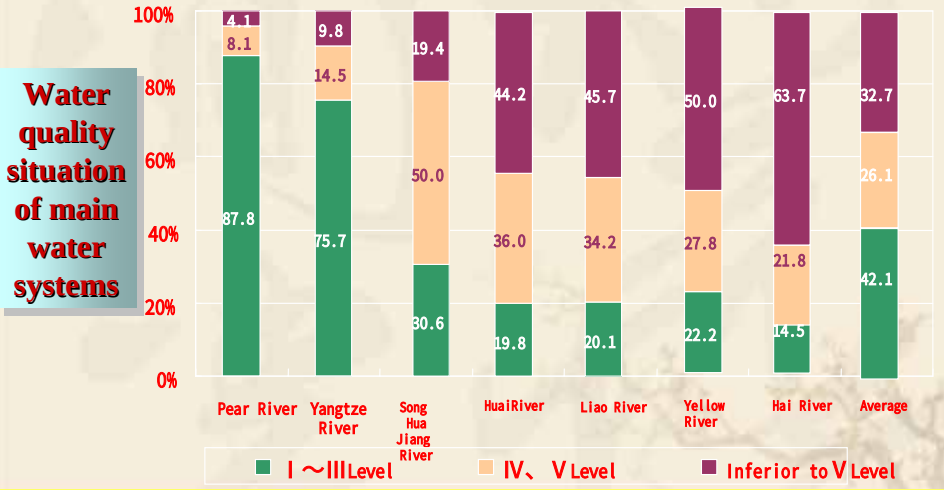
- **The average water resource in China is only 2300 m3, which is ¼ of the world's average level, being ranked at the 121st place as one of the world's 13 water deficient countries. Surface water pollution is quite common, especially with organic pollution of river sections flowing through cities. The lake Eutrophication problem is prominent. Meanwhile the groundwater is polluted by both point and non-point source. Pollution in coastal zone worsened.**



Startling Valley Water Environmental Pollution

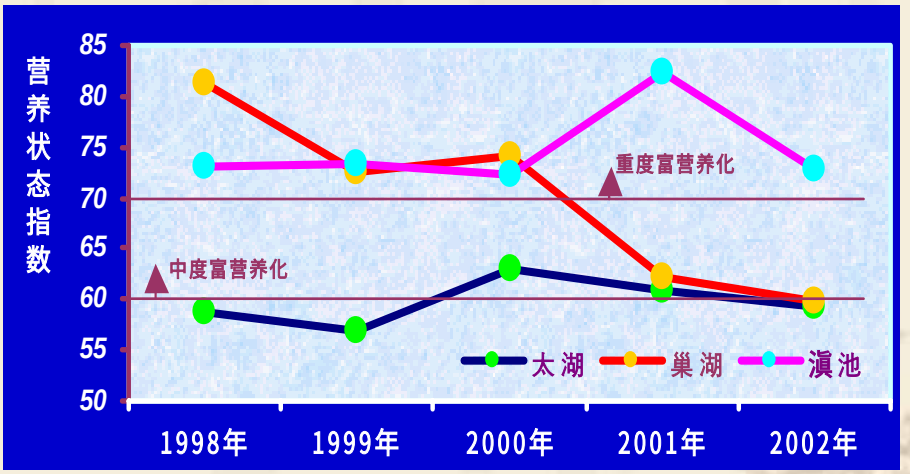
- Water quality of the 741 monitoring cross sections of the seven river water systems:
- 29% Ⅰ—Ⅲ Level, 30% Ⅳ、Ⅴ Level, 41% inferior to Ⅴ Level
- 80% of the more than 200 lakes in the east and southwest are of Eutrophication
- nearly one half of the town's drinking water source's water quality does not meet the standard

2003 Classification Proportion of Water Quality in Seven Water System



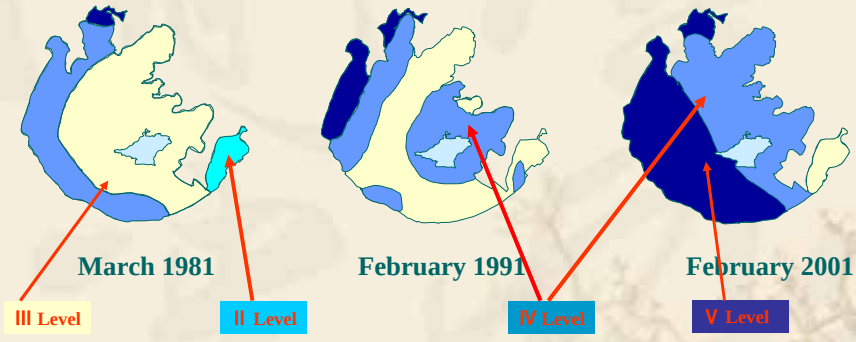
In 2003, 32% of the water quality of the 409 monitoring cross sections in the seven water systems is below V Level

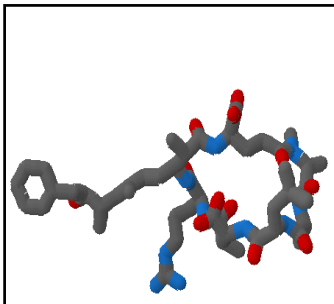
Water Quality Change Trend of the "Three Lakes"



In 75%Lakes there appear different extent of Eutrophication

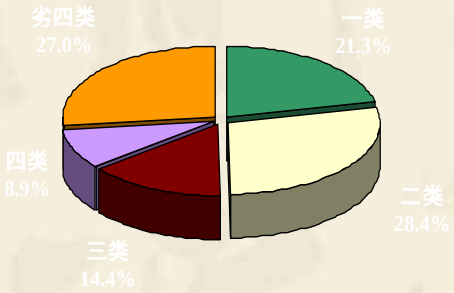
Water Quality Change Distribution of Tai Hu Lake During Recent 20 Years





Algae Toxin Molecule Structure

Sea Water Quality of Alongshore Sea Area



Alongshore sea area's water quality classification in 2002

➢In 2002, the pollution in alongshore sea area lightened to certain extent. Ⅰand Ⅱlevel sea covered total amount of 49.7%,which increase 8.3% according with last year

➢The water quality of Yellow Sea and Nanhai Sea is well while Donghai Sea and Bohai Sea is not well.

Increasing Frequency of Red Tide

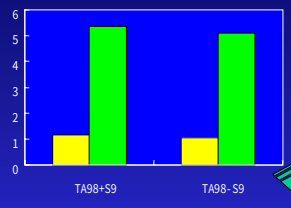
Scope and frequency of red tide were increasing. N and P from land sources could lead to Eutrophication, which is the origin of red tide.

Stat. Of the Costal Area's Red Tide Frequency in Past Years

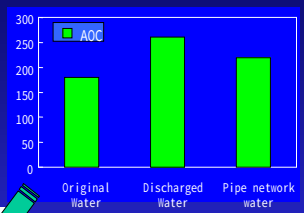
Frequency of red tide had been increasing from 1984. In 1998,there were 22 red tides in China, which was the most in history. In 2001, there are 77 times, which covers area of 15 thousand km² and the total loss was RMB 1 billion, which was more 49 times and 5 km² than in 2000.

Drinking Water Safety is Facing Threaten

Serious organic micro-pollution



Low biological stability

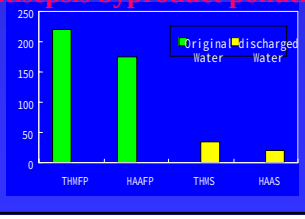


Algae &Algae Toxin

NH3-N and Nitrite

Hidden trouble of drinking water safety

Antisepsis byproduct pollution

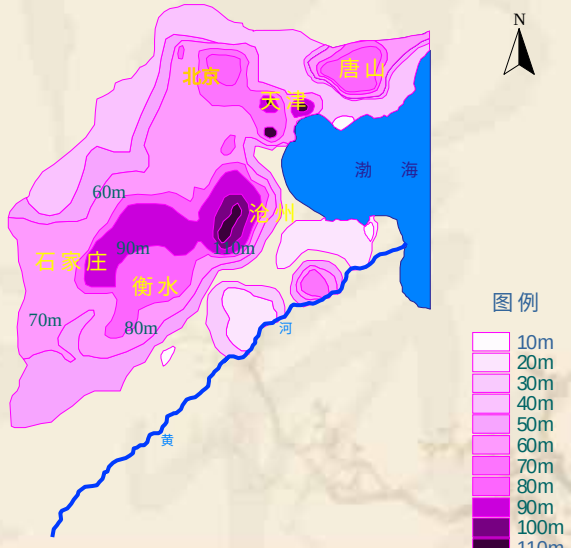


40.6% water quality in urban drinking water sources throughout the nation is comparatively bad. About 30% of the populations' drinking water is polluted.

Biological pollution

➢Serious Over-exploration of Ground Water

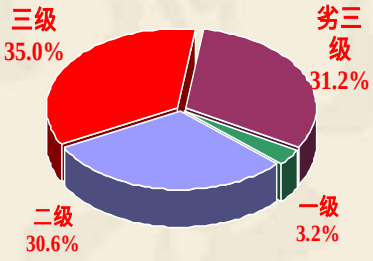
In China there forms underground fillers of different size in about 60 cities and regions, among which the underground fillers of North China Plain is about 30,000-50,000 km^{2,} becoming the world's biggest regional filler distribution region.



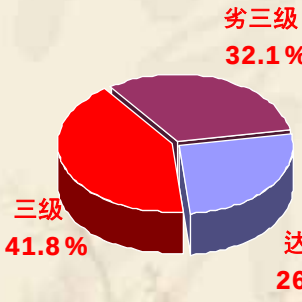
Depth of groundwater of Hai He Plain in 2000

The Air Pollution is Aggravating, Seriously Threatening Human Health

Among the 340 cities monitored in 2003, 30% of them is enduring serious air pollution.



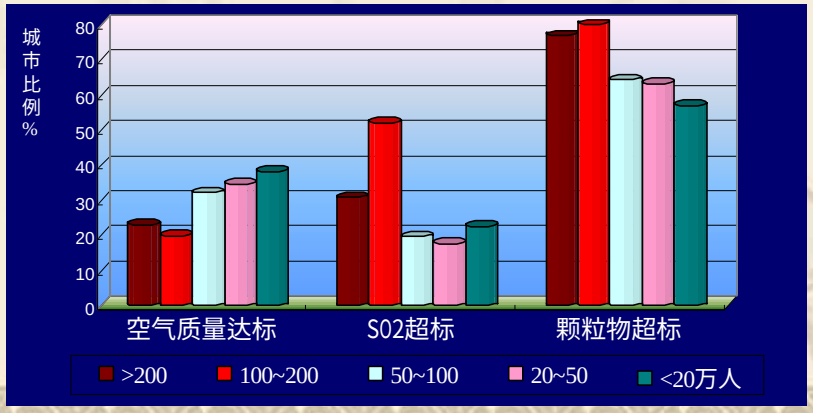
Proportion of Cities Meeting Air Quality Standard



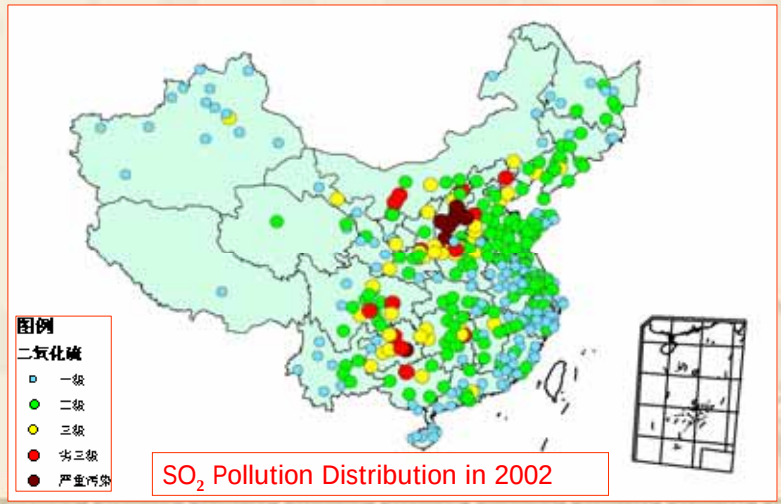
Population Proportion under Different Air Quality Situation

Comparison of Air Pollution Extent of Cities at Different Scale

The air pollution in huge and super cities is more serious than than in middle and small cities. The pollution in super cities with the population around 1,000,000-2,000,000 is most serious.

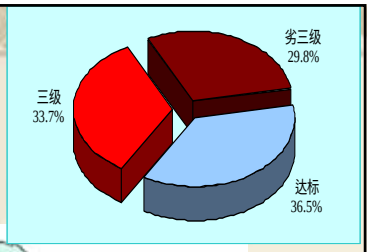


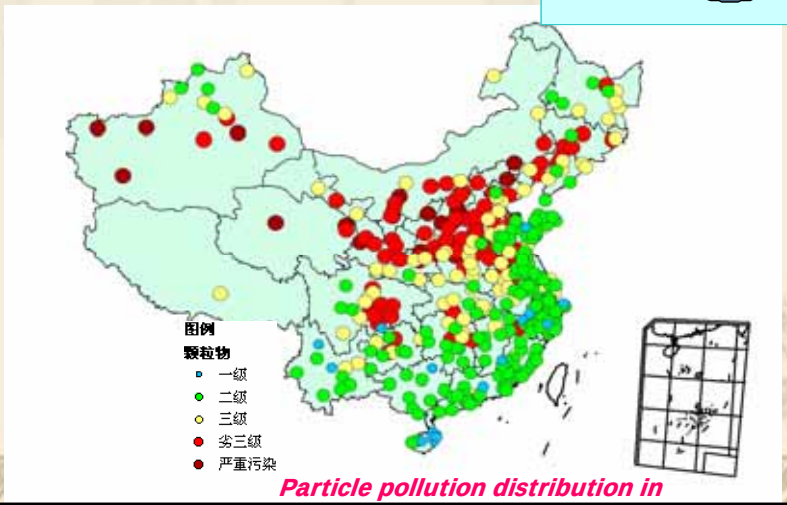
- SO_2 in 22.4% cities exceeds secondary standard, distributing mainly at provinces, such as Shan Xi, He Bei, Gui Zhou, Gan Su and so on, as well as Chong Qing City



SO_2 Pollution Distribution in 2002

Particle is the main pollutant affecting China's air quality. 63.5% cities' particle exceeds the standard limit.

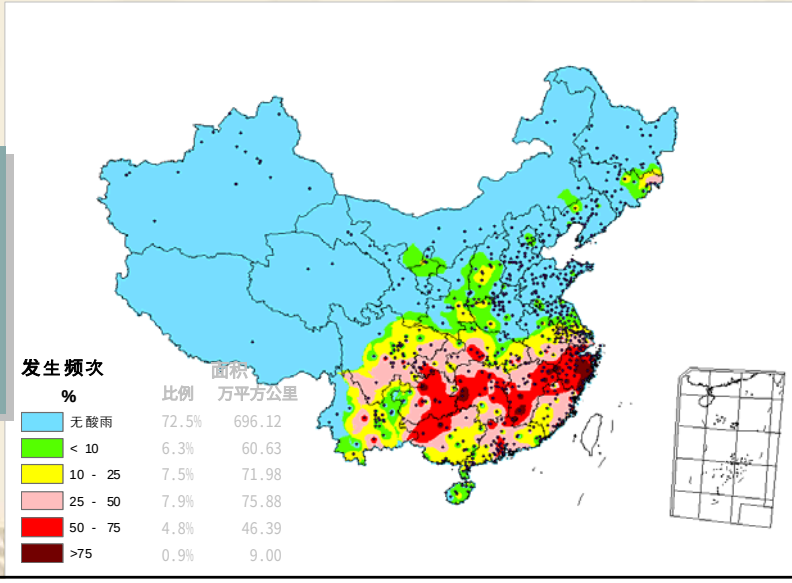


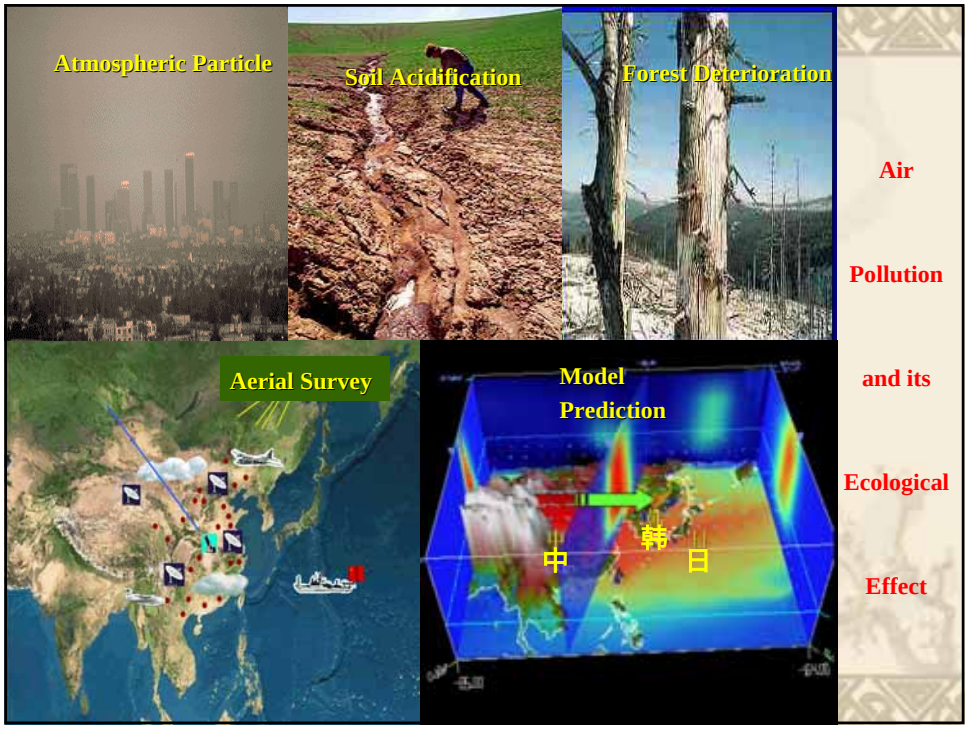


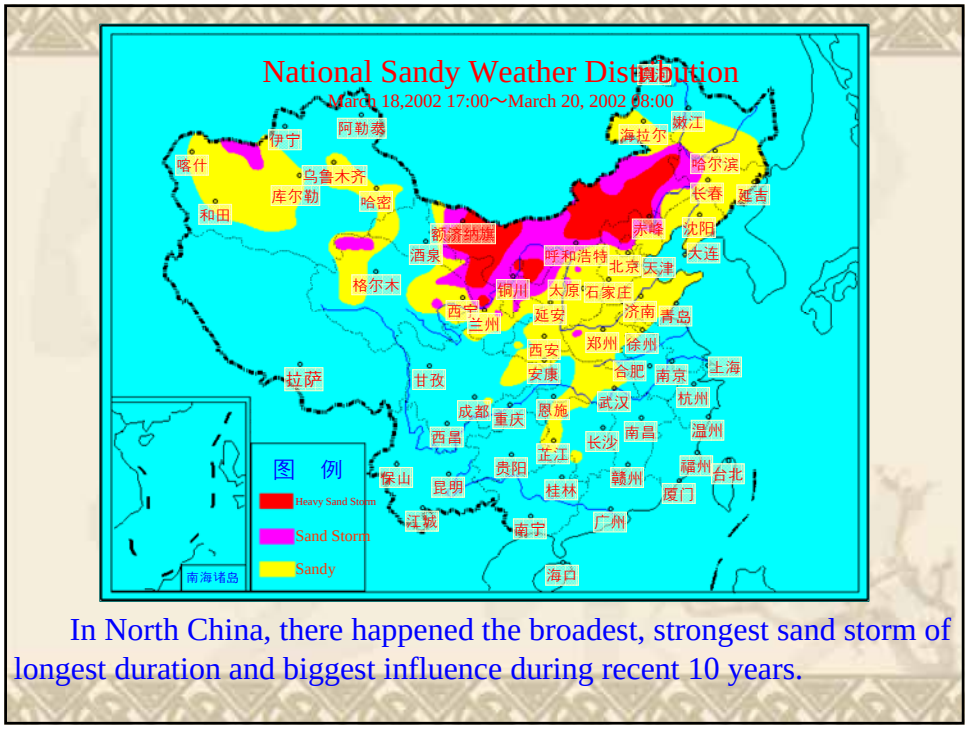
Particle pollution distribution in

Problems of air visibility and acid rain are still serious, having got the tendency of worsening. The loss caused by acid rain each year has reached 110 billion RMB

Acid Rain Pollution Situation







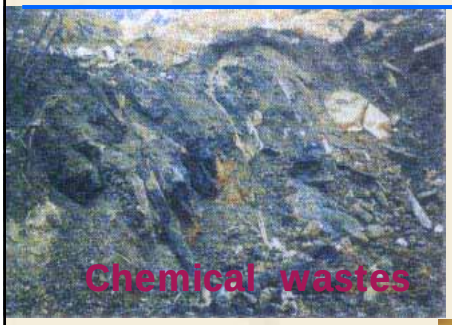
In North China, there happened the broadest, strongest sand storm of longest duration and biggest influence during recent 10 years.

PM2.5 Nox

Pollution worsened

Traffic Jams Increase Vehicle Emissions

Solid Wastes



Chemical wastes

- Atmosphere, water and soil has been polluted more and more seriously by solid wastes
- In 2003, the total garbage amounts was up to 0.15 billion tons, which could not be disposed. Many cities were surrounded by them
- Harms from agricultural solid wastes, hazard wastes and POPs becomes more and more prominent day by day.

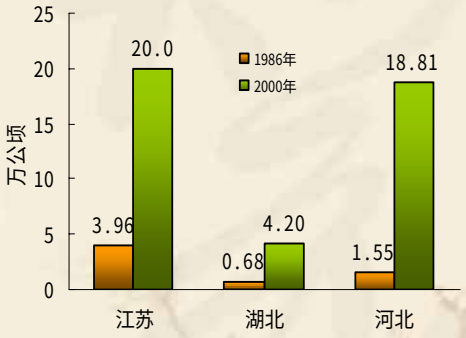
Medical wastes

It is shocked that many electronic wastes came into China

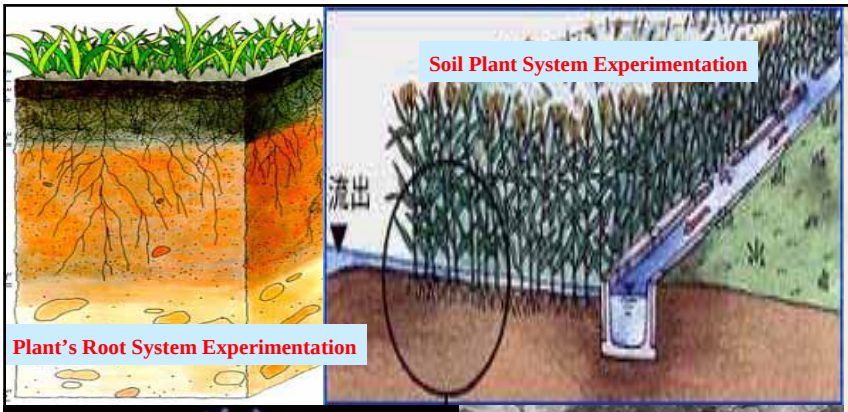
➢ Long History of Sewage Irrigation, with Prominent Soil Pollution and Enlarging v Irrigation Area

The sewage farming area in mid-east China takes up 7.3% of the whole nation's total farming area, with plantations polluted by heavy metals, such as cadmium, arsenic, chromium plumbum and so on, occupying 1/5 of the total sewage farming area.

In 1950s, Shen Yang City explored 6 sewage irrigation regions of Shen Wu, Hun Nan, Hun Bei, Zhang Tu, Hu Pu, Xi He, with the area of 1.024 million units of area, taking up 45.7% of the total irrigation area.

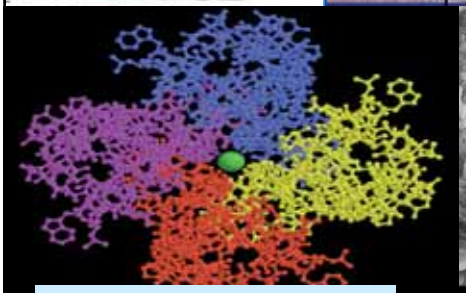


Sewage Irrigation Farming Area Change in Jiang Su, Hu Bei and He Bei Province

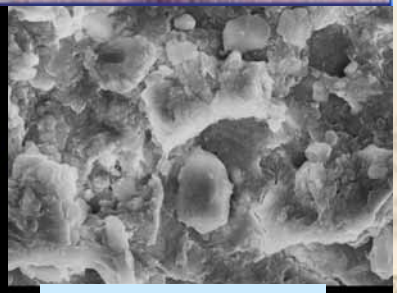


Plant's Root System Experimentation

Soil Plant System Experimentation



Remained Agricultural Membrane



Degradation of Soil Pollutant

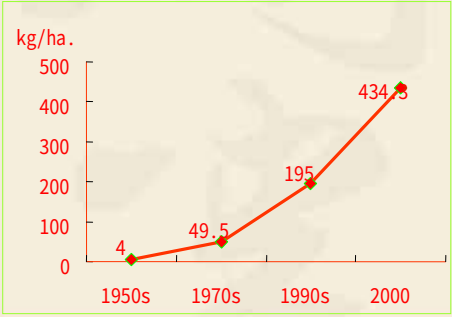
Solid Wastes Pollution Effect in Soil

Serious Non-point Pollution in Countryside

➢**Inappropriate fertilization method, with low utilization efficiency.**

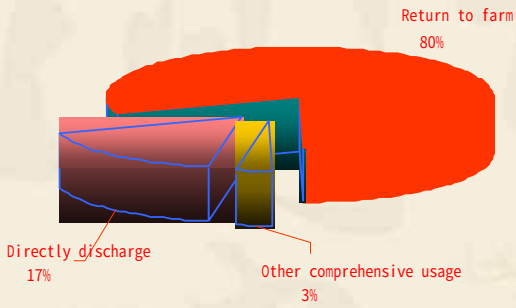
In 2000, the average fertilization amount per unit area was 434.3 kg/hectare, which is 1.93 times of safe fertilization upper limit (the international standard is 225 kg/hectare), with utilization rate of just 40%.

The mercury concentration in seriously polluted vegetable planting soil is 98 times of the standard.



Quantitative Change Figure of Average Fertilization

➢ A great amount of pollutants come from Livestock feeding, with high absolute index of direct discharging, polluting the environment seriously.



Instructional figure of livestock waste usage

Currently, the pollutants produced by livestock feeding has reached more than 2 times of industrial solid wastes. The amount is even 4 times of the industrial solid wastes in part of places, such as He Nan, Hu Nan, Jiang Xi.

➢Serious Food Safety Problems

In 2000, the check of urban vegetable wholesale markets in 16 provinces indicated that the total pesticide concentration turning out to be 20%～60%, with total over limit rate of 20%～45%.

In 2000, there happened 13 seriously large scale pesticide toxicosis affairs , with 164 persons suffering from toxicosis, and 15 persons die of it.

“Modern Environmental Health Risk” Becomes more and more Prominent

Incidence of disease and death rate caused by environmental pollution increase as no safety guard for drinking water sources’ water quality and serious air pollution.

- **In 11 big cities, water and air pollution drive more than 50,000 persons go to heaven.**
- **River water environment deterioration with dramatically decrease of hydrobiontes species and amount**

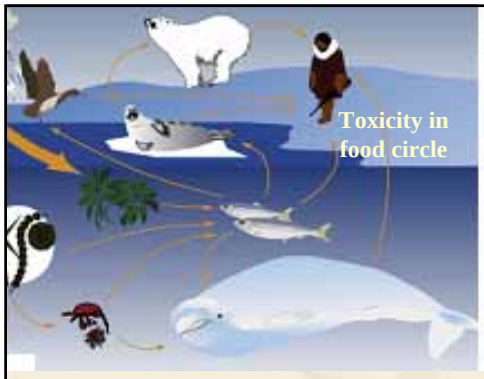
Great amount of organic metabolite

shellfish

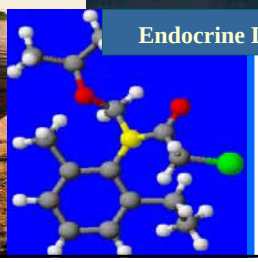
seaweed

As、Hg-betaine
DMA(二甲基砷)、
DMM(二甲基汞) 、
POPs

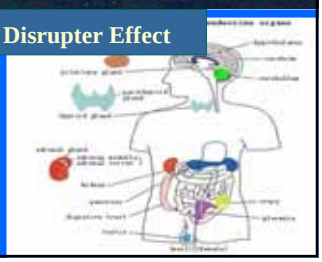
Are existing in sea products.



Ecotoxicological Effect



Endocrine Disrupter Effect

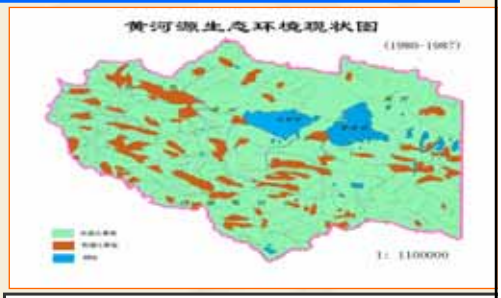


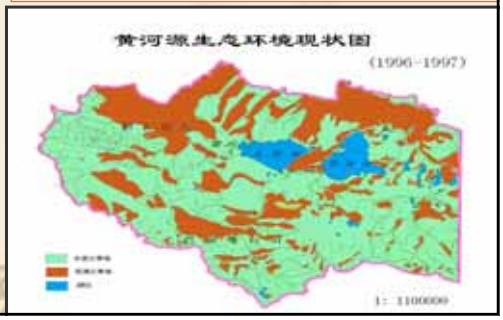
❖ Yawp Pollution Becomes More Serious

In 2003, 21% traffic yawp were over level among the 401 monitored cities , and regional yawp were over level in half of the 352cities.

Ecological Degeneration is Getting Even More Acute

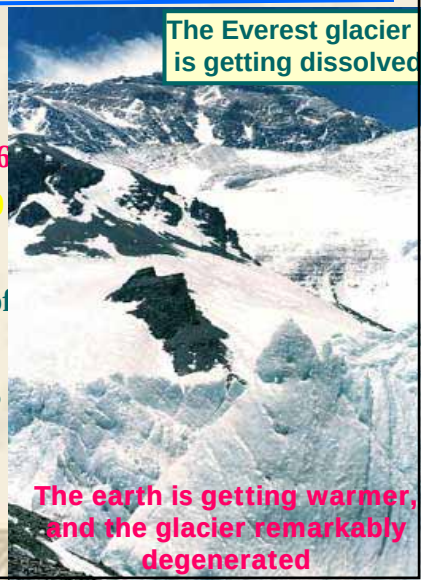
- Water and soil erosion area has reached 3.56 million km^2
- Desertification land area is about 1 million km^2
- Wildwood is less than 1/10,forest quality declines
- 2/3 grassland degenerated
- Overdraughting of groundwater (Filler area in Hai He Plain is 20,000km^2)
- Of the 1121 endangered species around the world, 190 species are in China (IUCN)





Economy Affected by Global Change

- The climate is getting warmer in near hundred of years，and the average temperature has raised 0.6－0.7℃. The sea level has raised10－20cm，and the glacier reduced about 25% from the termination of small ice age.
- Execrable weather made our GDP decrease 3－6%。



1.3 Cause of Environmental Problems

（1） Emphasis in economy development while ignoring environment protection

（2） Extensive developing mode with low technology and high assumption. High contamination discharge.

（3） New environmental problems from new technology and high assumption.

（4） Absence of environmental policy

（5） Need for environmental standard system strengthening.

1.3 Cause of Environmental Problems

(1) Lack of macro-guidance thought to build resource efficient and environmental friendly society under scientific development concept

(2) Incomplete development pattern, being short of economy and environment coordinative development pattern with high S&T content, good economic efficiency, low resource consumption and less environmental pollution

(3) Insufficient acknowledgement of rules of ecological construction and environmental protection, with some of the explorations and constructions disrespect objective law or even violate it

(4) Insufficient investment in environmental S&T, being short of original research and scientific research on causes of big environmental problems as well as the corresponding control method

(5) Lack of synthetic scientific research based environmental quality standard and decision-making system, with the constitution of environmental standard be devoid of environmental benchmark resaerch and quite a lot of decision-making without consideration of environmental factors.

1.3 Cause of Environmental Problems

(6) Insufficient promotion strength of circular economy, relying on the end management of management and control after pollution while ignoring source control

(7) Lack of environment-economy win-win concept, with certain place making emphasis on economic development while ignoring overall development

(8) Sick systems of environmental management, standard and monitoring, with weak law execution and supervision strength

2. Analysis of Environmental S&T Development Trend

Emphasis on end environmental pollution control	→	Source control prevention first Circular economy Ecological industry
Pollution source discharge concentration control	→	Total control based on environmental capacity and water quality objective
Emphasis on single pollution control engineering	→	Comprehensive control and prevention of complex regional pollution

Single ecological restoration → Emphasis on ecological care and rebuilding paying attention to regional difference

Protection of Ecology & environment → Research on risk analysis and control countermeasures of environmental pollution's comprehensive environmental effect towards human health

Contamination discharge standard → Environmental standard system based on environmental benchmark, environmental function and social development objectives

Research on the coordinative relationship between ecological environmental protection and economic social development

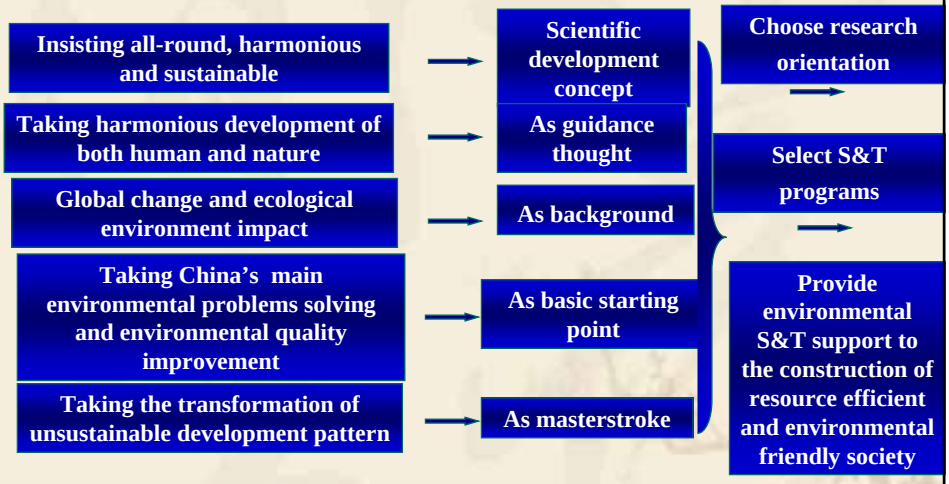
3. Environmental S&T's Demand

3、Environment S&T Demands

- Complete construction of environmental quality insurance system's S&T demand for wealthy society;
- Prominent environmental problems faced in rapid urbanization development as well as its S&T demand
- S&T demand of new industrialization and ecological industry
- Environmental problems and environmental S&T demand in agricultural modernization
- Technical demand of ecological care, restoration and rebuilding
- Technical demand of technical development of environmental and ecological monitoring
- Key environmental S&T demand for guaranteeing human health
- Environmental problems and S&T demand during energy exploration
- Key scientific problems and S&T demand of circular economy
- S&T demand of key valley water pollution control and regional atmospheric pollution control
- S&T demand of global environmental impact and international environmental practice

4. Environmental S&T's Strategic Guideline and Action

Strategic Guideline Thought, Action and Objective of Environmental S&T



Strategic Action

- complex pollution prevention, promoting comprehensive regional management and control
- quantify ecological value, caring about fragile ecosystem
- change the development pattern, promoting circular economy
- response to global change, carrying out international practice
- increase government investment, forming environmental market economy
- insisting on human based, insuring human health

Strategic Objective

The environmental S&T objective in 2012 is to preliminarily establish a comparatively consummated environmental science and technology reseach and innovative system, to provide scientific and technical support for overall control of new ecological destroy born by artificial factors, improvement of energy and resource utilization rate, deduction of environmental pollution to the largest extent, urban environmental quality improvement, establishing of a series of ecologically fine circular cities and regions, ecological environmental restoration of ecological fragile areas and the keeping within limits of environmental quality deterioration trend.

Strategic Objective

The environmental S&T objective in 2012 is to provide S&T support to prominent improvement of environmental quality, lessening the gap from developed countries further in the fields of important scientific theory of ecological environment, environmental pollution prevention as well as key technologies of control and management, with the harmonious relationship between social economic development and environmental resource together with countermeasures thereof for overall realization of wealthy society building stretched out. Strong and firm science and technology support would be provided.

5. Environmental S&T's Strategic Research Field

5. Environmental S&T's Strategic Research Field

5.1 Research on the establishment of environmental resource insuring technical system for wealthy society

5.2 Research on circular economy
5.3 Research on ecological construction and safety of organisms
5.4 Research on key comprehensive control and prevention technology of regional complex pollution
5.5 Research on environmental quality monitoring system
5.6 Research on environmental standard system
5.7 Research on global environmental problems
5.8 National environmental S&T capability building
5.9 Research on key technology concerning nuclear and radiation safety
5.10 Research on environment and health
5.11 Key technology of countryside environmental pollution prevention and control and its adjustment countermeasures
5.12 Research on new typical environmental problems

5.1 Research on the Establishment of Environmental Resource Insuring Technical System for Wealthy Society

Establish synthetic mid-term and long-term environmental techno - economic forecasting platform, to conduct research on the development objective of overall wealthy society building's demand on environmental resources, with the strategic system of environmental resource insurance for the development objective of basic realization of national modernization in 2020 stretched out.

5.2 Research on Circular Economy

The traditional technical pattern of industrialization would be transformed gradually through the sectional and regional implementation scheme, to establish comparatively integrated technical system, theory and methodology of circular economy, so that sustainable resource utilization, ecological balance and environmental quality would be made sure while China's rapid developing of its economy

5.3 Research on Ecological Construction and Safety of Organisms

According to the objective of national ecological construction and environmental protection, research would be conducted on certain important science and technology supporting techniques in the field of ecological environmental protection and management for next one or two decades, to provide S&T support for the improvement of the overall technical level, fully exerting the basic function of ecological environmental S&T therein.

5.4 Research on Key Comprehensive Control and Prevention Technology of Regional Complex Pollution

Research on subarea national environmental pollution control is conducted on the basis of valley and region's natural character as well as ecosystem health, to identify systematically total control scheme of main contaminant. Environmental management technical system concerning total control of valley and regional contaminant / environmental quality supervision would be set up, carrying out study on habitat restoration demonstration of typical regions, to bring along the improvement and development of China's environmental S&T as well as the technical level of pollution prevention control and management, so that the economic, social and regional sustainable development of the nation would be advanced.

5.5 Research on Environmental Quality monitoring System

In order to clarify China's environmental pollution, environmental quality situation and development trend, to provide technical support for the establishment of national environmental data guarantee system, advanced environment monitoring technology, environmental information technology and remote sensing technology are developed to conduct large area, whole weather and whole day long dynamic monitoring of environmental pollution and ecological destroy, realizing the establishment of complete emergency response system for air, water, solid waste and ecological monitoring, which takes on abilities of prognosticating, forecasting, pre-alarming and emergency responding.

5.6 Research on Environmental Standard System

Strategic guidance thought of China's environmental standard development: taking overall construction of wealthy society, clear air, safe water and qualified food for the people as the strategic objective, research should be carried on environmental standard theory suitable for China's environmental management feature to establish environmental standard system applying for scientific development concept, meeting the demand of environmental pollution prevention and ecological protection, promoting industrial structure adjustment, enhancing sustainable development capability and advancing environmental management development.

5.7 Research on Global Environmental Problems

Establish national environmental protection scientific research team of global environment on the basis of “Tenth-five Year” research. Scientists of other native department and research institutes would be organized to carry out research concerning new global environmental problems in the field of global environment to develop new research technologies and methods, forecasting both global and Chinese climate as well as environmental evolvement and global change’s impact on China’s main ecological areas. The dynamic responding relationship among climate change, desertification and aerosol interference would be studied, while researching on the impact of climate change towards biodiversity and water resource to reveal the mechanism of global climate change’s influence on China’s main ecological typical ecosystem. New technologies and theories fitting for and slowing down deterioration trend of global change would be developed to provide scientific basis and support for China’s national economy’s sustainable development and international practice implementation.

5.8 National Environmental S&T Capability Building

Build 10 national key laboratories, 30-50 ministry key laboratories or engineering technology centers, 5-10 sharing open wild observation and monitoring station in 5-10 year, to establish national environmental S&T innovation operational mechanism, forming S&T innovation team of appropriate structure, brilliant subject feature, advanced scientific research condition, optimized member knowledge structure and powerful guarantee.comparative advantage in certain fields would be formed.

5.9 Research on Key technology Concerning Nuclear and Radiation Safety

- Establish regulations and standard system frame of nuclear safety, setting up important regulations completing corresponding standards；
- Preliminarily establishment of effective supervision system;
- Accomplish several technical break through in technology of nuclear and radiation safety;
- Searching for a set of methods to establish highly safety culture;
- Preliminarily setting up of educational training system of nuclear and radiation safety;
- Effective control of work irradiation, public irradiation and medical irradiation level, enhancing safety management of radioactive source;

5.10 Research on Environment and Health

Synthetic and disciplinary research would be conducted on traditional contaminant and new contaminant's impact mechanism on ecosystem and human health as well as environmental risk assessment, incarnating thought of "human based. Study would be carried out in the responding of ecosystem and human health to main environmental pollutant and ecological destroy, to establish new environmental safety identification index, control benchmark and risk assessment system of environmental ecological pollution, providing reliable environmental and health basis background research data for the national management decision-making departments and technical support for relevant environmental disaster risk prevention and control scheme.

5.11 Key Technology of Countryside Environmental Pollution Prevention and Control and its Adjustment Countermeasures

- Consummating countryside ecologic and environmental observation/monitoring network system, precisely clarifying and forecasting evolving trend of China's countryside ecological environment;
- Typical technical demonstration of ecological agriculture and ecological villages;
- Obtaining independent innovation ability of solving countryside key ecological and environmental problems, formulating complete technical supporting system of country environmental pollution control and ecological construction;
- Establishment of environmental benchmark and standard system aiming at countryside non-point pollution control;
- Consummating laws and regulations system of countryside environmental protection;
- Development of countryside ecological, environmental assessment and pre-alarming system;

5.12 Research on New Typical Environmental Problems

- Research on N circulation rule, transference and transformation mechanism and interdiction way, to provide technical support for Eutrophication control;
- Establish technical system of China's typical environmental endocrine disrupter pollution control, entirely predominating the pollution character, rules and evolvement trend as well as pollution effect of China's typical environmental endocrine disrupter;
- Entirely control of atmospheric mercury emission, conducting total control;
- Reduce furthest from the source the environmental pollution which may born of vehicle rejection, promoting rejected cars' resource—lization;
- Reduce total amount of electronic waste from the source and procedure, conducting end safety recycle and disposition;
- Identifying function mechanism of China's environmental hormone, stretching out national control action plan

6. Guarantee Measurements of Environmental Sciences' Development Strategy

Guarantee Measurements of Strategy Implementation

Improve S&T Environment
Improve S&T Capability
Enhance International Cooperation

Guarantee Measurements

- **Increase investment in environmental S&T**

  Induct S&T innovative development

- **Enhance S&Support**

  Strengthen environmental S&T capability building

- **Further S&T systematic reform**

  Improve environmental S&T's capability supporting national decision-making

- **Further intensify international cooperation**

  Fully exerting environmental S&T's important functions in international practice

谢谢 Thanks!

请多提宝贵意见……

Your precious suggestion is welcomed

Second Five-Year Plan (2006-2010) of the National Institute for Environmental Studies (Japan)

Thank you for hosting TPM3 in Jeju

Takashi IIJIMA,
Executive Director, NIES, JAPAN

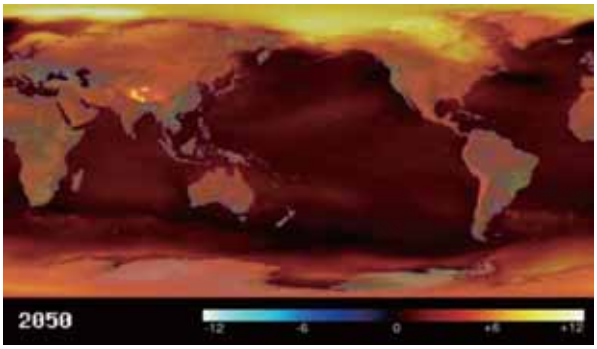
For the 3rd Tripartite Presidents Meeting in May 2006 (Jeju)

Recent Timeline

- Jan 2001: Environmental Agency becomes Ministry of the Environment, Waste Management Division established at NIES
- Apr 2001: NIES established as an independent administrative institution
- Apr 2001 to Mar 2005: First Five-Year Plan
- Apr 2006 to Mar 2010: **Second Five-Year Plan**

Outstanding Research: First Five Year Plan (eg. Climate Change Research Project)

Prediction of Climate Change by the Earth Simulator (Highest Performance Super Computer)



Collaborative Research among NIES, CCSR and FRCGC

Top Level Research Performance Evaluation by CSTP

Council for Science and Technology Policy (CSTP, part of Japan's Cabinet Office) gave its top class evaluation to NIES research achievements in 2005

CSTP Ranking of Research Institution Activities in 2005

	S-Rank	A-Rank	B-Rank	C-Rank
RIKEN (Science)	3	5		
NIES	1	4		
AIST (Science & Tech)	1	5		
JAMSTEC (Oceans)	3	7	3	
JAXA (Space)	1	10	3	

First Five-Year Plan → Second Five-Year Plan

- Scoping of Research & Prioritization of Research Resources (6 Projects & 2 Programs → 4 Programs)
- Changing Staff Status Government Official → Non Government
- Duty of confidentiality Automatically applied → Obligated by NIES Law as equivalent to government official level
- Appropriate Research Evaluation
- Promotion of Outreach Activities

Reforming Research Divisions

First Five Year Plan (2001-2005)

Priority Research Projects (6)
- Climate Change
- Ozone Layer
- Endocrine Disrupters and Dioxins
- Biodiversity
- Watershed Management
- Urban Air Pollutants (PM2.5/DEP)

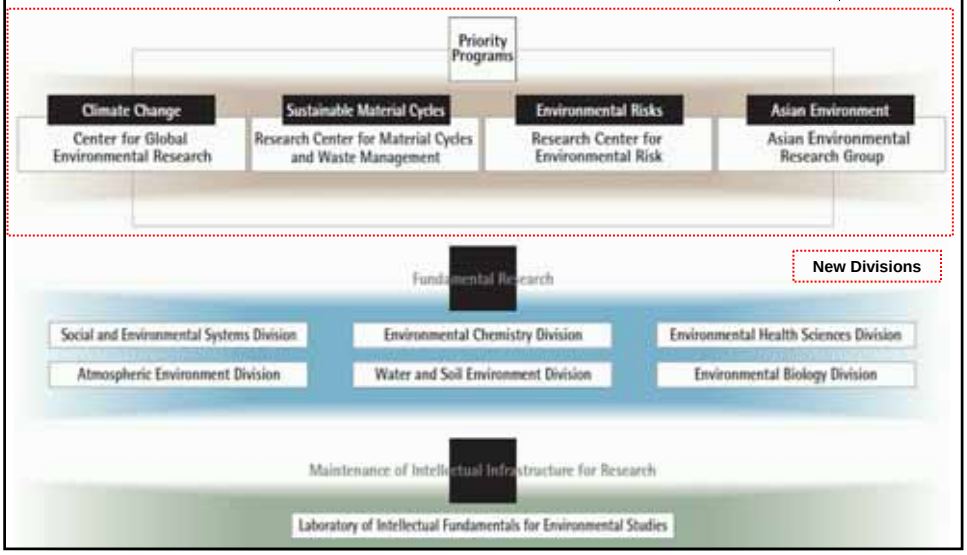
Policy Response Research (2)
- Material Cycles & Waste Management
- Environmental Risk of Chemicals

Scoping and Prioritization

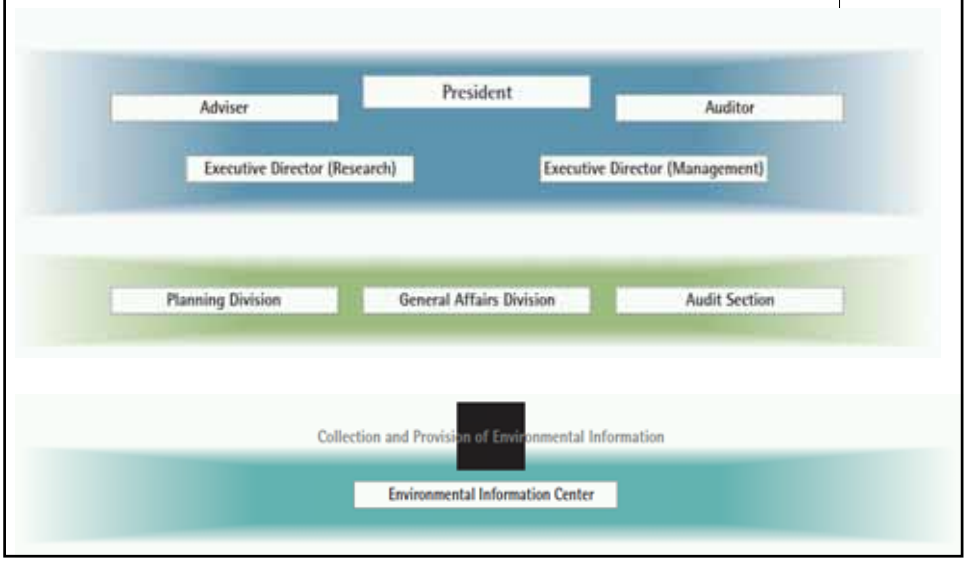
Second Five Year Plan (2001-2005)

4 Priority Research Programs
- Climate Change
- Sustainable Material Cycles
- Environmental Risk
- Asian Environment

New Research Divisions



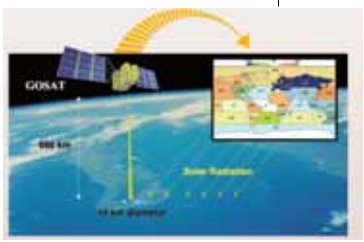
Headquarters, Administration, and Information Divisions



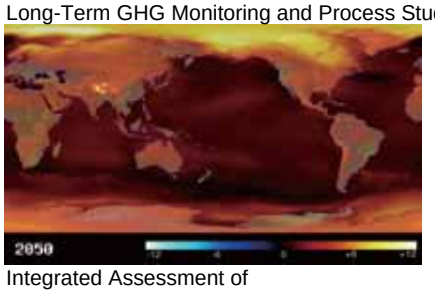
Highlights of Priority Program on

Climate Change

Long-Term GHG Monitoring and Process Studies



GHG Observation by Satellite (GOSAT)



Integrated Assessment of
Climate Change Impact & Risk

Research on Long-Term Vision Toward
Low-Carbon Society

Highlights of Priority Program on

Sustainable Material Cycles

Assessment Method for Managing
Material Cycle Systems

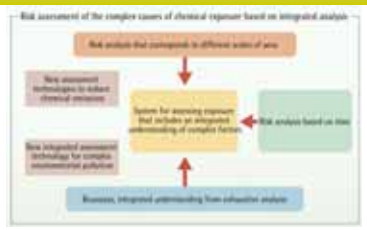
Management Method for Hazardous
and/or Recyclable Materials

Strategic Material Cycle Technology
Development for Waste Biomass

Development of Network for Managing
International Material Cycles

Highlights of Priority Program on

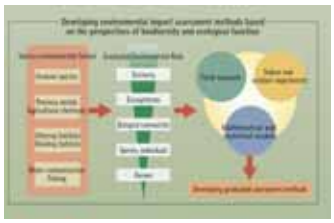
Environmental Risk



Cumulative Effect Assessment for Exposure to Various Chemicals

Environmental Health Impact Assessment for Personal Sensitivity Difference

Environmental Fate of Nano-Particulates and Environmental Impact Assessment



Biodiversity & Ecological Environmental Impact Assessment

Highlights of Priority Program on

Asian Environment

Development of Assessment Method for Asian Atmospheric Environment

Development of Water-Circulation & Natural Material Cycles Assessment Method in East Asia

Environmental Impact Assessment Method for Watershed Ecosystems

Personnel

Permanent Staff	:	259 (5)
NIES Fellows, Assistant Fellows, Specialists	:	153 (20)
Senior Guest Researchers	:	18 (0)
Guest Researchers	:	294 (5)
Junior Visiting Researchers	:	111 (11)
Collaborative Researchers	:	71 (26)

( ) Foreign Staff

Budget

	Category	2006-2010	2006
Revenues	Grant for operational costs	48,196	9,616
	Subsidy for facilities	2,420	415
	Income from commissioned work	20,275	4,055
	Other	70	14
	Total	**70,961**	**14,100**
Expenditures	Project costs	30,898	6,169
	Facility improvement	2,420	415
	Expenses for commissioned work	20,275	4,055
	Personnel expenses	14,795	2,919
	General administrative expenses	2,573	542
	Total	**70,961**	**14,100**

Unit: million yen

Session 2 Presentations

The 3rd Tripartite Presidents Meeting

16-19 May 2006, Jeju Republic of Korea

Research Activities on Sound Management of Chemicals in NIER

Kyunghee CHOI, Ph.D.

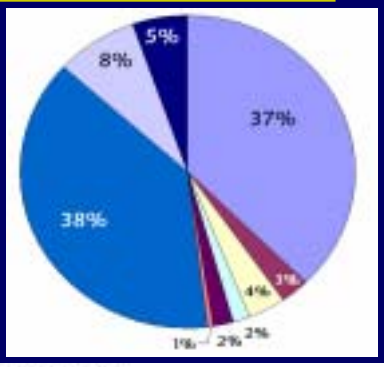
National Institute of Environmental Research

Republic of Korea

- Legislation Structure
- New Chemicals Notification
- Classification/Labeling
- Chemicals Accident Response System
- Circulation Volumes & PRTR
- Chemicals Risk Assessment
- International Trends & Cooperation
- Future Direction

Chemical Industry in Korea*

Exports 27.75 billion dollars

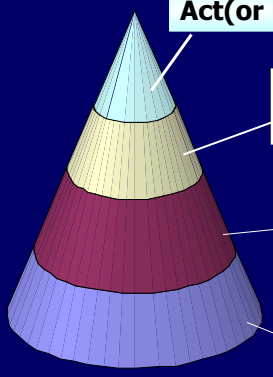


Imports 24.5 billion dollars

- Organic chemicals
- Inorganic chemicals
- Dyeing, tanning & colouring materials
- Medical & pharmaceutical products
- Essential oils and resinoids and perfume materials
- Fertilizers(Other than those of group 272)
- Plastics in primary forms
- Plastics in non-primary forms
- Chemical materials & products, n.e.s.

(*based on 2005)

Legislation Structure



Act(or Law) : Purpose, basic requirements, penalties

Presidential Decree : exemptions, major-delegated rules

Ministerial Ordinance : more detailed rules

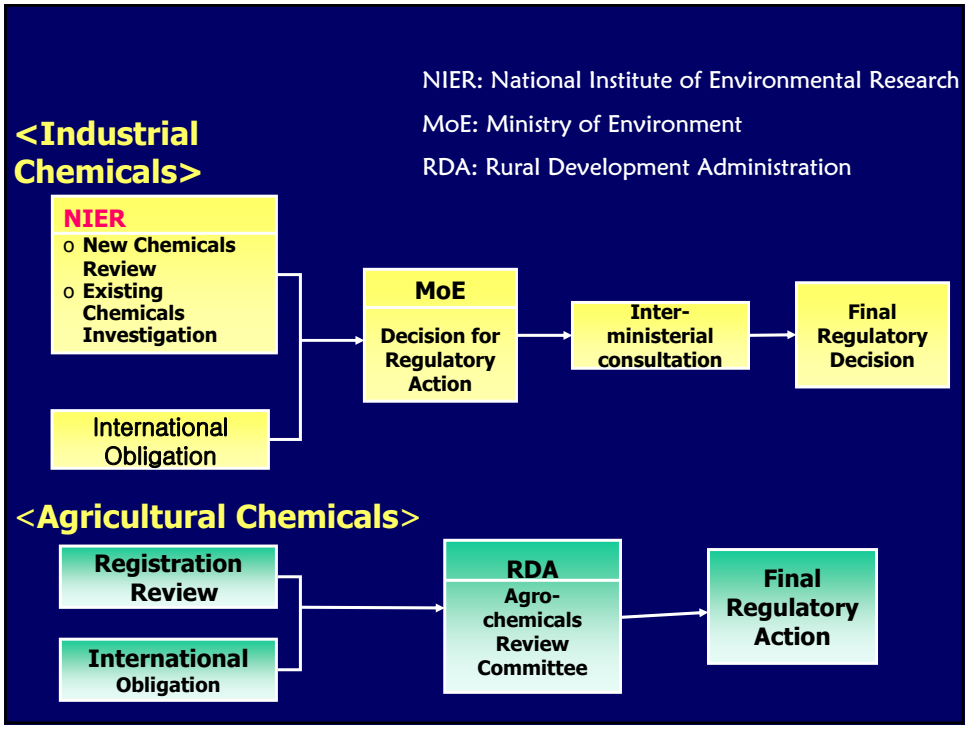
Public Notice : detailed administrative rules, guidance

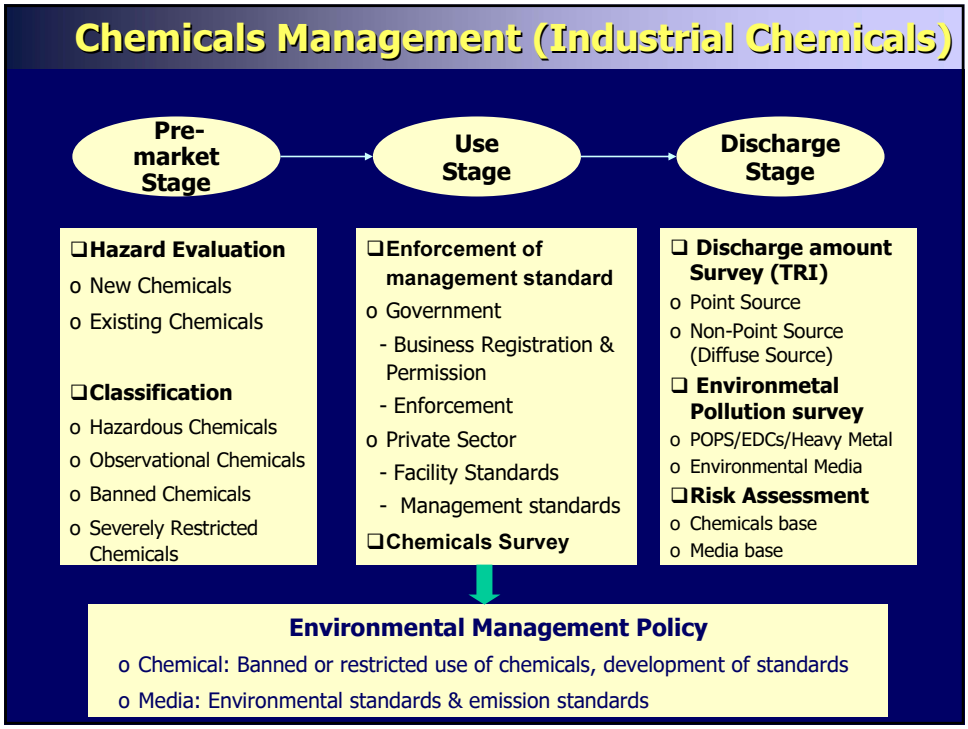
Official Gazette : public informing system by MoGAHA

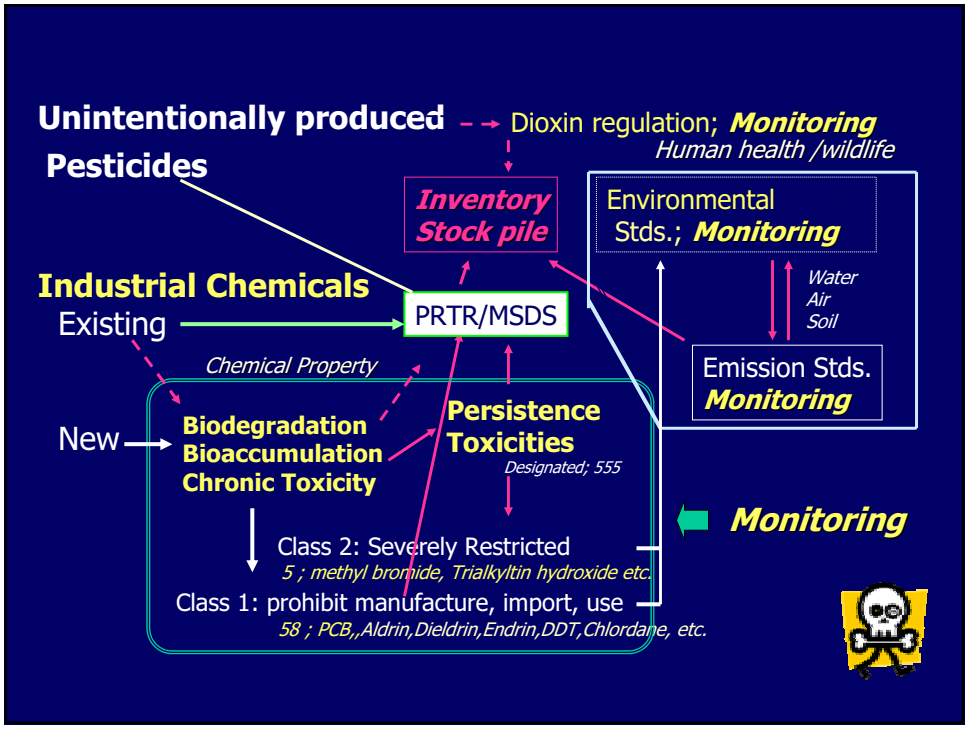
Functional elements and composition of the regulatory infrastructure

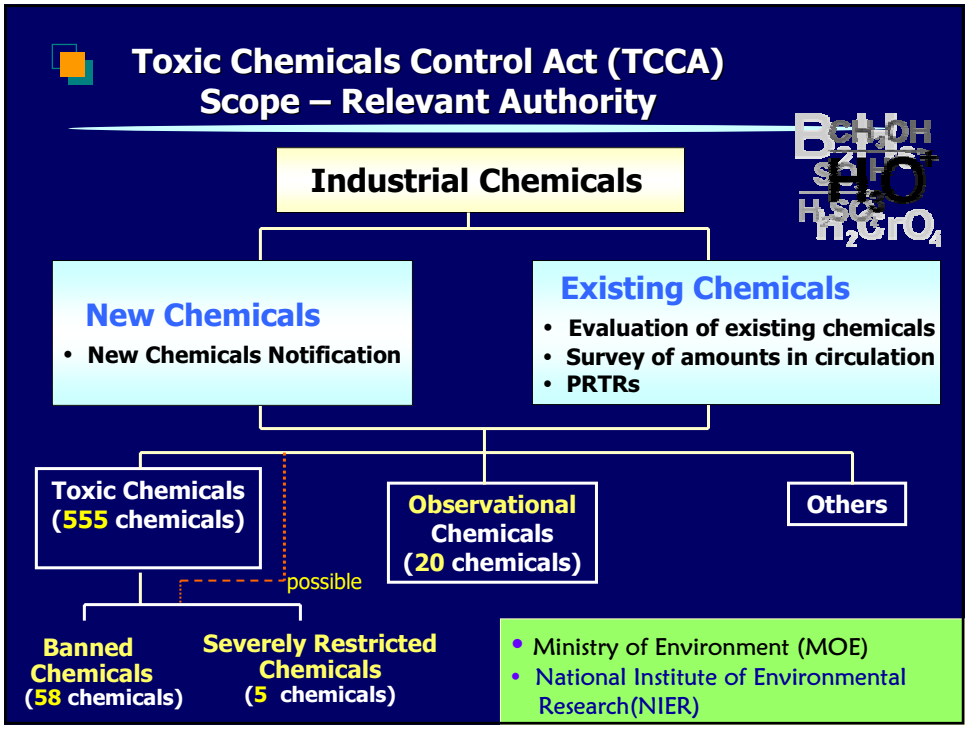
Chemicals Related Acts

Responsible Authority	Substances	Relevant Act	Objectives
Ministry of Environment	Toxic Industrial Chemicals	**Toxic Chemicals Control Act**	Protection of human and the environment from use of toxic industrial chemicals
Ministry of Labor	Hazardous substances Used at workplace	**Industrial Safety and Health Act**	Prevention of industrial disasters and creation of clean work environment
Ministry of Agriculture and Forestry	Pesticides	Agrochemicals Management Act	Securing the quality and proper use of Pesticides
	Feed additives	Feed Management Act	Management of feed and feed additives
	Fertilizer	Fertilizer Management Act	Fertilizer management
Ministry of Health and Welfare	Drugs and cosmetics	Pharmaceuticals Act	Proper management of dug and cosmetics
	Food additives Residual pesticides in agricultural products	Food Sanitation Act	Food additives management Management of residual in agricultural products
	Narcotics	Narcotics Act	Narcotics Management
	Psychotropic drugs	Psychotropic Drugs Control Act	Psychotropic drugs control
Ministry of Government Administration & Home Affairs	Dangerous substances in case of accident	Fire Services Act	Prevention and confrontation of fires
	Gunpowder	Guns, Swords and Gunpowder Act	Management of chemicals used
Ministry of Commerce, Industry and Energy	High Pressure (toxic) Gas	High Pressure Gas Regulation Act	For gunpowder Safe management of high pressure gas
Ministry of Science and Technology	Radioactive materials	Atomic Energy Act	Radioactive materials management
Ministry of Marine Affairs & Fisheries	Marine pollutants	Marine Pollution Prevention Act	Proper management of marine environments & fisheries


NIER: National Institute of Environmental Research
MoE: Ministry of Environment
RDA: Rural Development Administration
<Industrial Chemicals>
NIER
o New Chemicals Review
o Existing Chemicals Investigation
International Obligation
MoE
Decision for Regulatory Action
Inter-ministerial consultation
Final Regulatory Decision
<Agricultural Chemicals>
Registration Review
International Obligation
RDA
Agro-chemicals Review Committee
Final Regulatory Action


Chemicals Management (Industrial Chemicals)
Pre-market Stage
Use Stage
Discharge Stage
❑Hazard Evaluation
o New Chemicals
o Existing Chemicals
❑Classification
o Hazardous Chemicals
o Observational Chemicals
o Banned Chemicals
o Severely Restricted Chemicals
❑Enforcement of management standard
o Government
- Business Registration & Permission
- Enforcement
o Private Sector
- Facility Standards
- Management standards
❑Chemicals Survey
❑ Discharge amount Survey (TRI)
o Point Source
o Non-Point Source (Diffuse Source)
❑ Environmetal Pollution survey
o POPS/EDCs/Heavy Metal
o Environmental Media
❑Risk Assessment
o Chemicals base
o Media base
Environmental Management Policy
o Chemical: Banned or restricted use of chemicals, development of standards
o Media: Environmental standards & emission standards


Unintentionally produced
Pesticides
Dioxin regulation; Monitoring
Human health /wildlife
Inventory
Stock pile
Environmental
Stds.; Monitoring
Water
Air
Soil
Industrial Chemicals
Existing
PRTR/MSDS
Chemical Property
Emission Stds.
Monitoring
New
Biodegradation
Bioaccumulation
Chronic Toxicity
Persistence
Toxicities
Designated; 555
Monitoring
Class 2: Severely Restricted
5 ; methyl bromide, Trialkyltin hydroxide etc.
Class 1: prohibit manufacture, import, use
58 ; PCB,,Aldrin,Dieldrin,Endrin,DDT,Chlordane, etc.


Toxic Chemicals Control Act (TCCA)
Scope – Relevant Authority
Industrial Chemicals
New Chemicals
• New Chemicals Notification
Existing Chemicals
• Evaluation of existing chemicals
• Survey of amounts in circulation
• PRTRs
Toxic Chemicals
(555 chemicals)
possible
Observational
Chemicals
(20 chemicals)
Others
Banned
Chemicals
(58 chemicals)
Severely Restricted
Chemicals
(5 chemicals)
• Ministry of Environment (MOE)
• National Institute of Environmental
Research(NIER)

Evaluation of existing chemicals

- Evaluation (since 1988)

Total	516
Toxic Chemicals	51
Observational Chemicals	5

- 14 chemicals for year of 2006
- OECD/SIDS program

  10 chemicals including N-acethylaniline

Toxic Chemicals

- Toxic Chemicals Inventory (NIER Public Notice 2006-1, Jan. 2006)

  555 chemicals (including some groups)
  pictograms, R-& S- Phrases, the cut-off limit for its mixture
  available at MOE / NIER Homepage, www.nier.go.kr

- The cut-off limit for mixtures

  0.1% (carcinogen, reproductive toxicity), 1.0% (others)
  Exceptional cases : 5%, 6%, 10%, 50%

Examples

No.97-1-345 Formalin [CAS No. 50-00-0] and mixtures which contain 1 % or more Formalin

Classification/Labelling

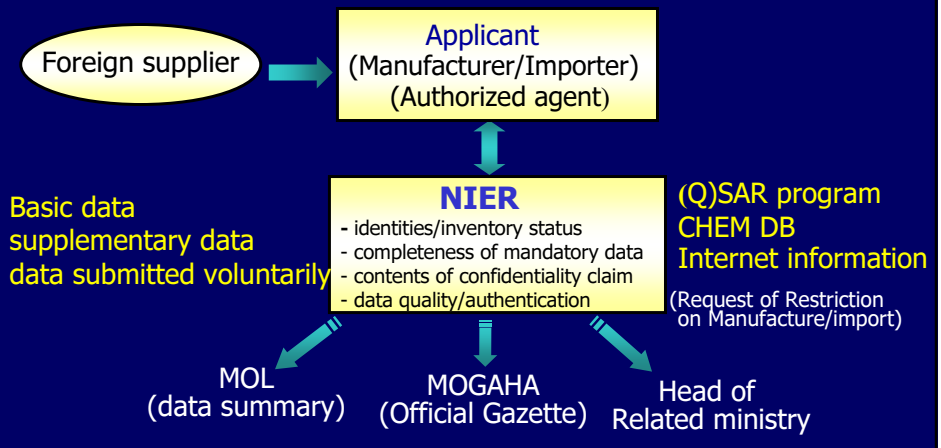
- Toxic Chemicals
  - Article 29 (TCCA) + NIER Public Notice No.2005-19

(Jan.6,2006)

- Format
  - 16 classifications(including water-resistant)
  - physico-chemical hazard, health haza
  - some differences with EU
- Labelling
  - Toxic chemical name or trade name
  - Pictograms, R-phrases, S-phrases

- Preparation for application of GHS to toxic chemicals (2005-)
  - Research on classification & labeling of toxic chemicals using global standard/ Implementation of GHS (2008)

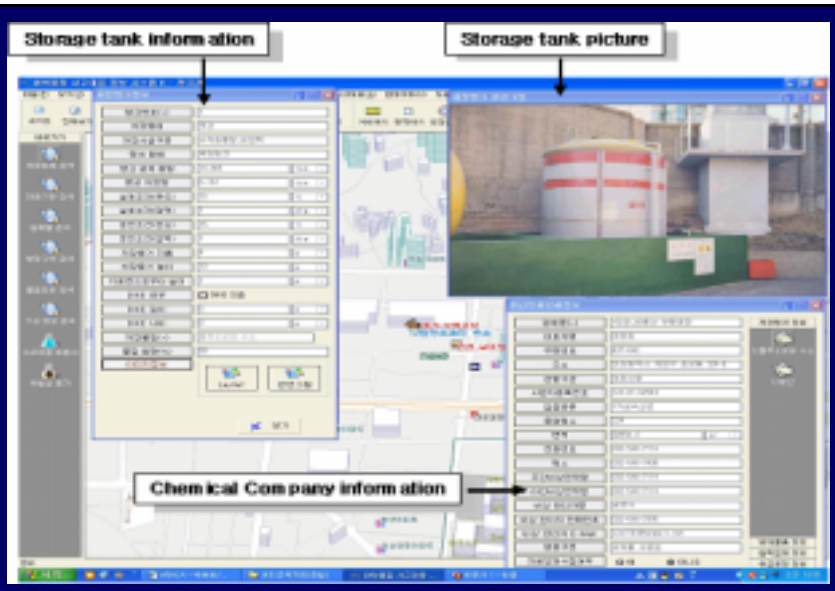
Notification Procedures



- **GLP standards/Test Guielines**
  (NIER Public Notice No.2006-04, Feb. 2006)
  - Applied items : toxicity, biodegradation data, LogPow
  - Test Guidelines : 4 categories / 23 items
  - No restriction for mutually acceptable data
- **Pre-evaluation**
  - Identities/inventory status
  - completeness of mandatory data
  - contents of confidentiality claim
  - data quality/authentication
- **Evaluation**
  - Adverse effects to Human Health
  - Adverse effects to Environment
  - Exposure to human or environment
  - Regulation status in developed nations

Chemical Accident Response System

Sketch of CARIS as a tool for the emergency response



▲ Chemical/physical properties of hazardous chemicals and contained information

▲ Sample output of the emergency response scenario information in CARIS

Circulation Volume and PRTRs of Chemicals

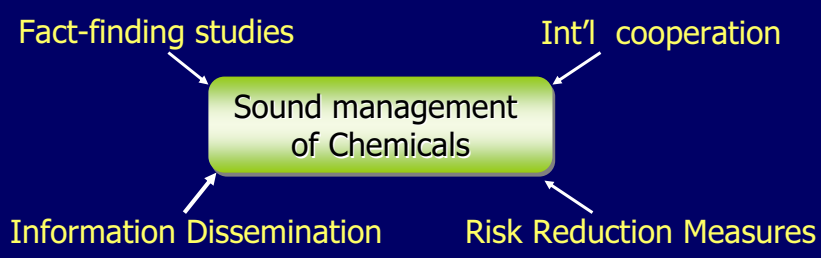
- Legal basis
  - Article 17 of the TCCA
  - Article 14 of the Presidential Decree
  - Article 12 of the Ministerial Ordinance
  - MOE Public Notice No.2006-9 (Jan. 16, 2006)
- Protection of confidentiality
- Survey of amounts in circulation of chemicals (4 year term)
- Mandatory reporting requirements
- Supporting instruments for PRTRs
  - Technical guidelines - Reporting software
  - Estimation software - Validation software

  www.tri.nier.go.kr

• MOE expanded the scope of industrial sectors to all facilities treating with the chemicals (about 3,000 facilities, 388 chemicals).

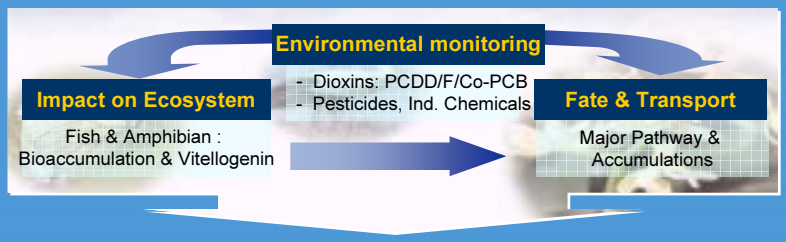
Strategies of Chemicals Management Policy

- Strengthening researches and fact-finding studies
- Dissemination of Information on Chemicals
- Promotion of International cooperation
- Devise risk reduction measures



Mid-term Research Program on EDCs/POPs

Phase I '99-2003 : Environmental Monitoring & Investigation of Impact on Ecosystem



Phase II 2004-2005 : Development of Risk assessment methodology & Prioritize the chemicals of concerns

Phase III (2006-) Formulation of Risk reduction measures

- Enhancement of International Cooperation for Information sharing
- Enforcement of Dissemination to Public &
- Minimization of Impact on Environment and Human health

Background of EDCs/POPs Issues

- A Social Concern with uncertainty
  - *Styrene dimer/trimer detection in instant noodle containers in 1998*
  - *PCB/DDT in biota at southern coastal area*
  - *Observation of imposex in whelks and other organisms*

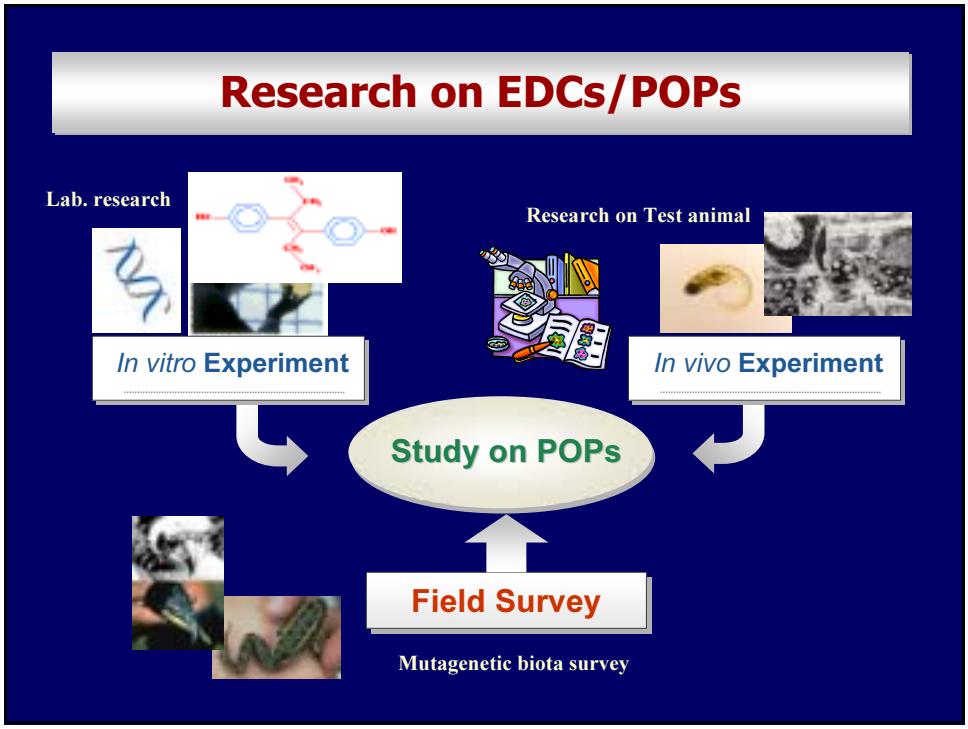
- Establishment of "Council for EDCs Countermeasure & Subsidiary Expert Committee"
- Establishment of 10 year Research Program on EDCs
- Implementation of Research Project
  - *Monitoring, Impacts on Ecosystem, Fate & transport*

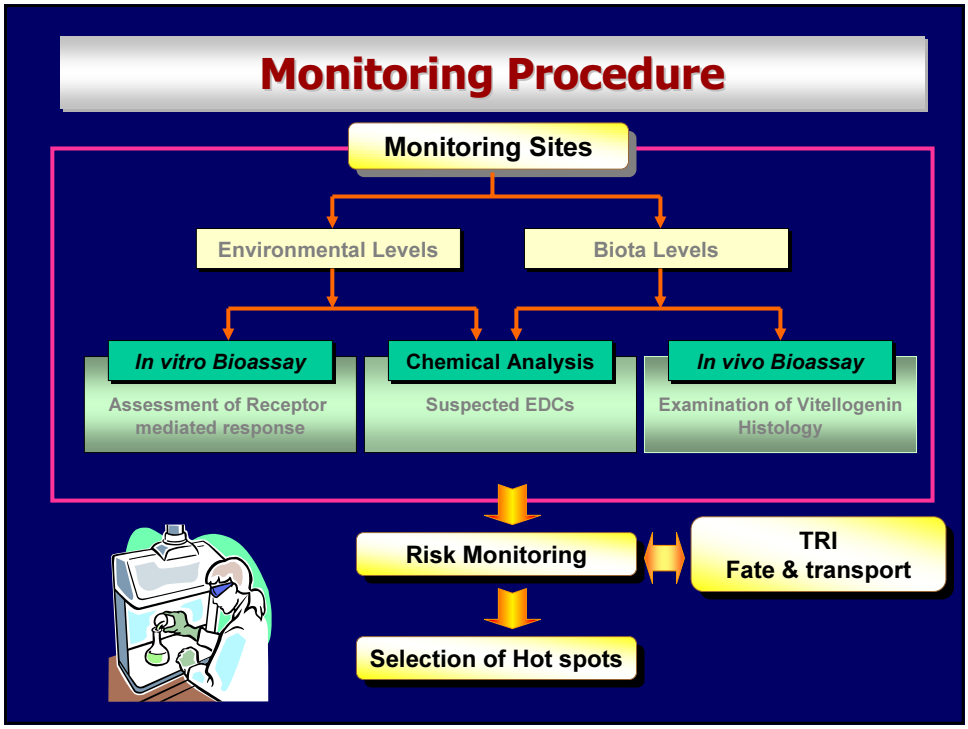
Major Activities (EDCs/POPs)

- Publication of Handbook on Endocrine disruptors (May 99,2004)
- Establishment of l0-year National Research Plan (July 99)
  - Interministerial Research Plan (5 years plan from 2007)
- National Action Plan on Hazardous Chemicals (Dec. 2000, May 2006)
- Establishment of Analytical Methods for EDCs (POPs)
  - 50 Chemical Groups (106 chemicals) including dioxins
- Establishment of Guidance Manual for in-depth investigation of impact on Ecosystem
- Research Project since 1999
  - *Environmental Monitoring on EDCs (POPs)*
  - *Impacts of EDCs (POPs) on Ecosystem*
  - *Investigation of Dioxin on small-and medium-scale Incinerators*
  - *Public's Consciousness and Consumption Pattern on EDCs (POPs)*
  - *Environmental fate and transport of EDCs (POPs)*
- Establishment of Dioxin Inventory (2001-2005)
- Chronological Trend Survey of POPs in Sediment(2005-2008)

Emission Inventory of Dioxins

- Goals
  - Preparation of Dioxin inventory with regards to Sources
- Project Terms : 2001 –2005
- Progress
  - Estimation technique for Dioxin emission on Point Sources
  - Monitoring of Point Sources
  - Estimation technique for Dioxin emission on non-Point Sources
  - Monitoring of Non-Point Sources


Research on EDCs/POPs
Lab. research
Research on Test animal
In vitro Experiment
In vivo Experiment
Study on POPs
Field Survey
Mutagenetic biota survey


Monitoring Procedure
Monitoring Sites
Environmental Levels
Biota Levels
In vitro Bioassay
Assessment of Receptor mediated response
Chemical Analysis
Suspected EDCs
In vivo Bioassay
Examination of Vitellogenin Histology
Risk Monitoring
TRI
Fate & transport
Selection of Hot spots

In-depth Monitoring Procedure

Detailed Investigation Areas

Environmental Media

Environmental Levels

-Track of chemicals within active media
- Identification of causes and effects by mechanisms

***In situ* Bioassay**

-Identification of causes and effects

Ecological Effects

Life Cycle / Physiological Changes

- Monitoring for changes of various indicator species

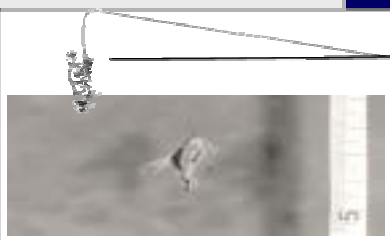
Exposure Assessment

- Identification of biomarker expression and changes

Prioritizing ⇔ **CSR Systems / Risk Assessment Tools**

Control Management / Source Management

Abnormalities



Gonad of *C. auratus*(붕어)

Gonad of *Hemiculter eigenmanni*(치리)

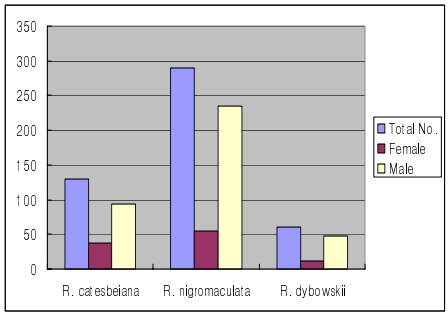
Gonad of *Zacco platypus*(피라미)

Gonad of *Acheilognathus yarmatsutae*(줄납자루)

* Macroscopic abnormality of organs were not shown. But, some cases of histological abnormality were found in 5 regions.

Sex ratio of amphibians

Rana catesbeiana



Study on Environmental Toxicology

Environmental Hazard Test

- EDCs/POPs
- Leachates
- Sediments
- Fish Kills

Breeding Management of Testing Animals

- fishes
- amphibians
- reptiles
- protozoa

Hazard Evaluation on Chemicals

Test Guideline

- Physical-Chemical Properties
- Ecosystem Effect
- Health Effect

Development of Toxicology Monitoring Technology

- Biomarker
- Bioindicator

GLP

- Designation
- Post- Management

OECD/SIDS Activities

- 10 Chemicals including Benzoyl peroxide

Safety test on Existing Chemicals

- 30 Chemicals/year
- Fishtoxicity, Genetic toxicity etc

Environmental Toxicology Research Center

- Ecotoxicology Research Center (04-05)

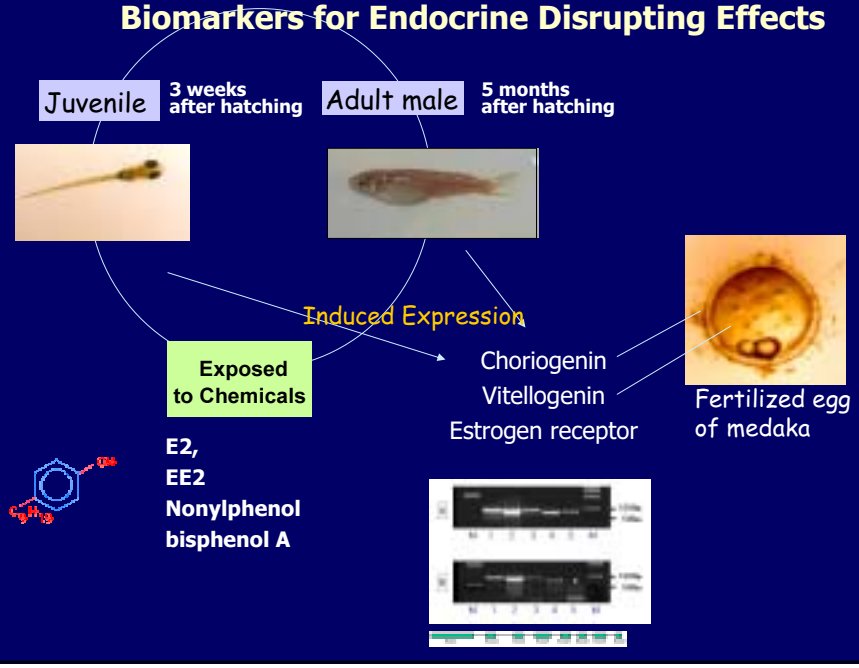
- Research for Eco-toxicology Center : 2004-2005
- Fish-rearing facilities, an exposure room & various eco-toxicology related labs.
- Installation of special facility for exposure research of Endocrine disrupting chemicals

- Human health toxicology Research Center (06-07)

- Research facility for rodents : under construction
- Clean room system for laboratory animals & specific installation for inhalation toxicity

Ecotoxicology Research Center

Biomarkers for Endocrine Disrupting Effects



Eco-toxicity Research

Fish toxicity tests
- Fish, Acute toxicity test
- Fish, Early-life stage test
- Fish, Partial-life stage test

Water flea Toxicity tests
- Daphnia, Acute Immobilization test
- Daphnia, Reproduction test

Earthworm Toxicity tests
- Earthworm, Acute Toxicity tests

*Test Chemicals : Heavy metals, Brominated flame retardants, Pesticides …

Medaka (*Oryzias latipes*)

Water flea (*Daphnia magna*)

Earthworm (*Eisenia fetida*)

+6 Chromium as Potassium dichromate

48h-EC_{50} = 0.3mg/L

Daphnia magna, Immobilization test (Acute toxicity test)

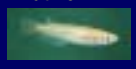
Toxicogenomics Research

Toxicogenomics Research with DNA microarray - Medaka and Nematode

DNA Microarray would be a reliable tool to speed up investigation of gene expression profiles and biomarkers for hazard chemicals such as EDCs and heavy metals

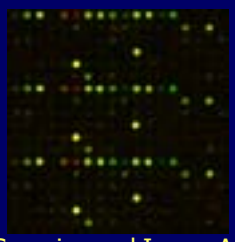
Expression Profiles of Alachlor - Exposed Medaka analyzed with a cDNA microarray

Alachlor



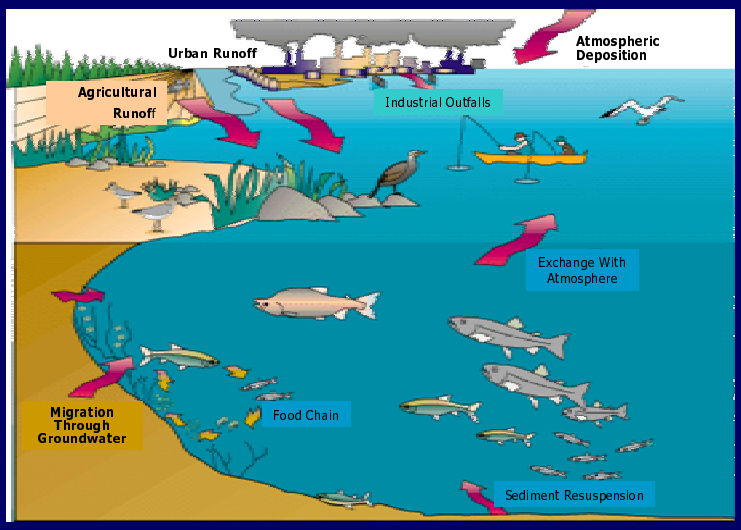
Total RNAs Isolation

Hybridization



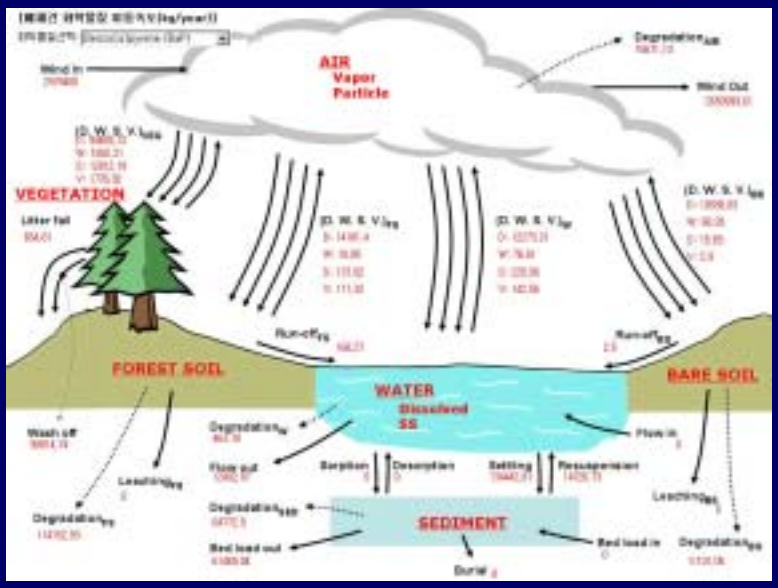
Scanning and Image Analysis

Sources & Pathways of Pollution

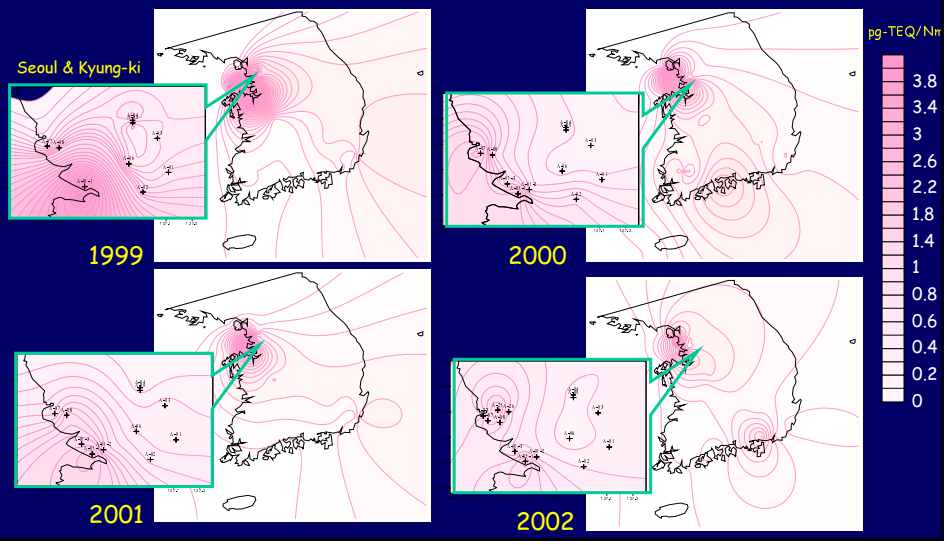


(U.S. EPA Great Lakes National Program Office, www.epa.gov/docs/grtlakes/)

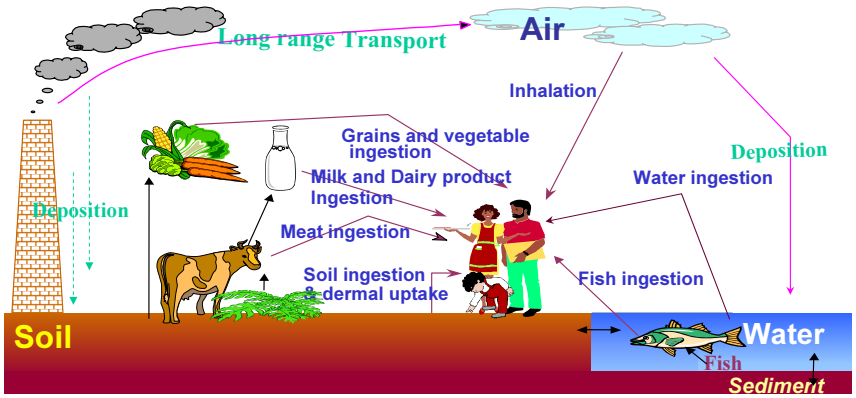
Intermedia Transport - Benzo[a]pyrene



Annual distribution Trends of Dioxins in Air



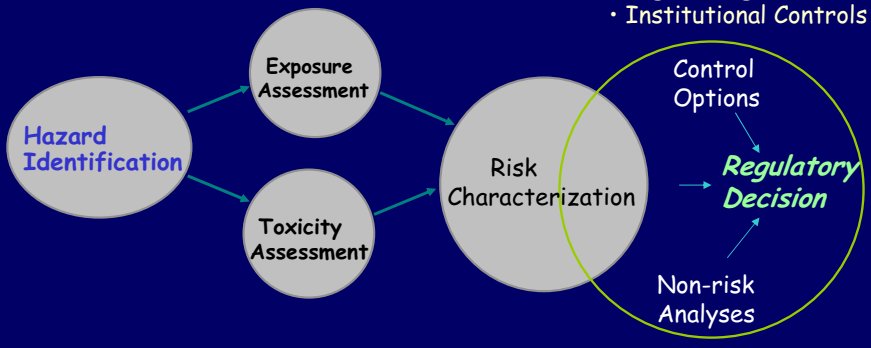
Multimedia Exposure Pattern of Population for Endocrine Disruptors



Risk Assessment & Management

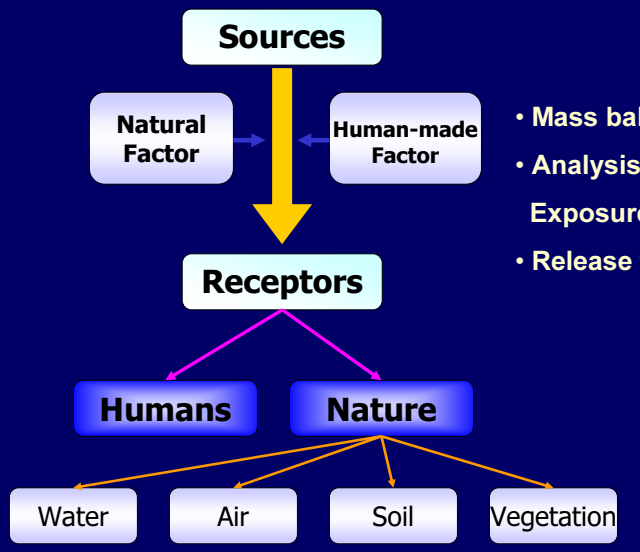
TCCA Article18 (Risk Assessment)

- Technical Feasibility
- Engineering Controls
- Institutional Controls



- Economic
- Sociopolitical
- Legal

Simultaneous Approach of Sources & Receptors for Integrated Environment Management



Goals

- Mass balance of Chemicals
- Analysis of Multi-media Exposure
- Release to Environment

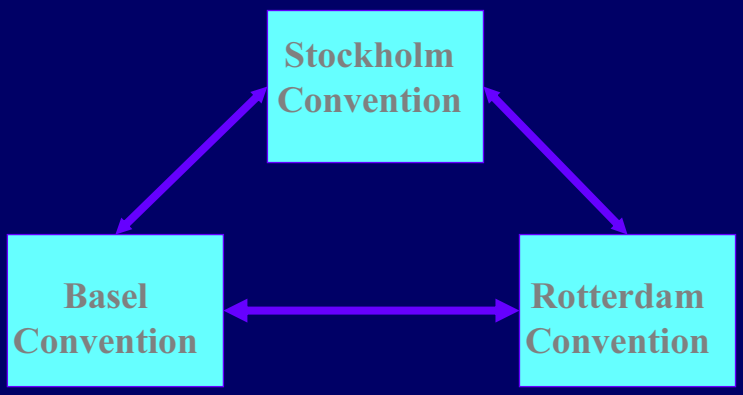
International Trends & Cooperation

- International Agreements :
  - Rotterdam Convention/ Stockholm Convention/ Basel Convention
- UNEP- GEF Regional Based Assessment on PTS
- EU REACH Program
  - REACH : Registration, Evaluation & Authorization of Chemicals
- Bilateral Research Cooperation
  - Korea-Japan Joint Project / Korea- China Joint Project

Relationships among the Stockholm, Basel and Rotterdam Conventions



Treaties on Chemical Management



Life Cycle Management

- The 3 treaties together cover elements of "cradle-to-grave" management

Scope and Coverage

- Evaluating/regulating new chemicals (PIC and POPs)
- Evaluating/regulating existing chemicals (PIC and POPs)
- Import/export controls (PIC, POPs and Basel)
- Disposal (POPs and Basel)
- Hazard communication (PIC, POPs and Basel)
- Environmental releases (POPs)
- Other links, eg, regional treaties

Operating Framework

Rotterdam Convention Secretariat

Notification form
Import Response
Export Notification

Ministry of Environment

Industrial Chemicals

Ministry of Foreign Affairs & Trade

Rural Development Administration

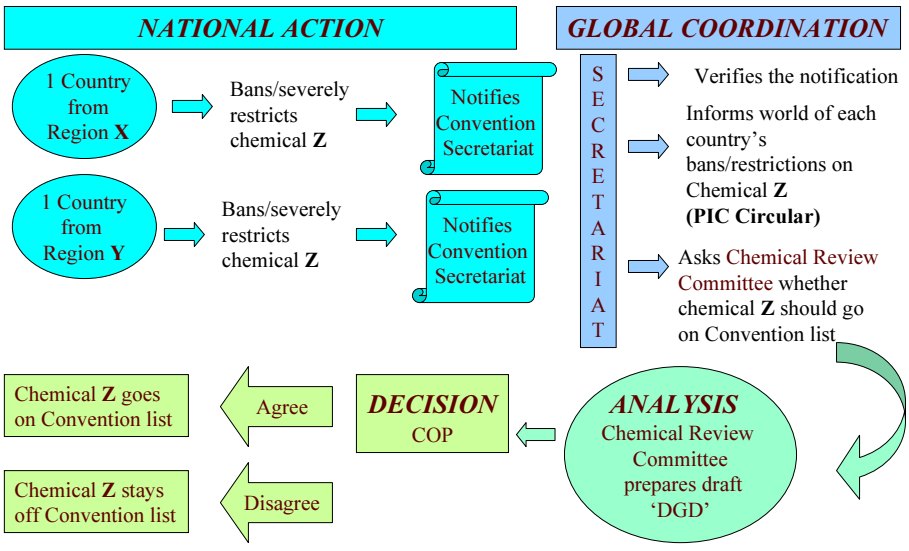
Pesticide & SHPF

Elements in national decision making process for inclusion/exclusion of industrial chemicals in PIC procedure

- Hazard of Chemicals
  - CMR (Carcinogenicity, Mutagenicity, Reproductive Toxicity)
  - PBTs (Persistent, Bioaccumulative, Toxic Substances)
- Impact of Chemicals to Industry
  - Cost – benefit analysis : consideration of economic loss etc.
- Substitutes of Chemical / Alternative Process
  - Availability of substitutes
  - Possibility of alternative process

* Precautionary Principle

Overview of banned or severely restricted chemicals under the Rotterdam Convention



Global Initiative on PTS

1. Stockholm Convention

2. Regionally Based Assessment of Persistent Toxic Substances

UNEP

The Regions

Central & North East Asia (Region VII)

http://www.chem.unep.ch/pts

UNEP

Definition of Region VII

- China
- Japan
- Republic of Korea
- Democratic People's of Korea
- Mongolia
- Russian Federation
- Kazakhstan
- Kyrgyzstan
- Tajikistan
- Turkmenistan
- Uzbekistan

Characteristics of PTS

- Persistent
  - ✓half-life in water > 2 months
  - ✓half-life in soil > 6 months
  - ✓half-life in sediment > 6 months
- Bio-accumulative
  - ✓bio-concentration factor > 5,000
  - ✓log Kow > 5
  - ✓MW < 1,000 Daltons
  - (not included in Annex D)

Characteristics of PTS

- **Toxic**
  - ✓ binds to the AHR
  - ✓ Evidence of chronic adverse effects
  - ✓ Continuous release and subsequent exposure

- **Transboundary Movement**
  - ✓ measured levels in distant locations from release
  - ✓ chemical has potential for long-range transport through air, water or migratory species
  - ✓ for air transport, half life > 2 days

PTS Migration Processes

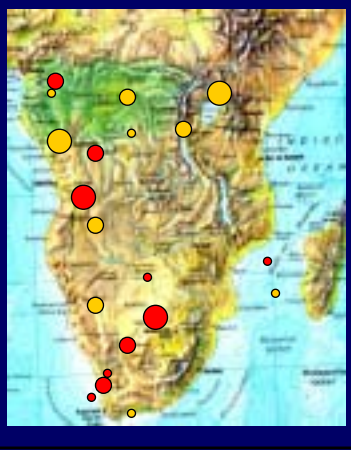
(Stockholm Environment Institute, 1998)

RBA WEB mapping (GIS)

➢ **Mapping of RBA results in thematical layers**

- Sources
- Concentrations
- Effects
- etc.

⇒ GIS & maps ---> " RBA at a glance "



Hot Spots

➢ *Limited Data available*
➢ *Sampling sites localized*
➢ *Sampling, analytical methods :Non-standardized*

Sources :

- *Obsolete pesticides (Soviet Union)*
- *OCP (Pearl River Delta)*
- *PCDD/DF (uncontrolled burning of municipal waste)*

Central & North East Asia map

Environmental levels & Ecological effects:

- *HCH (Kazakstan)*
- *PAHs (Sea of China, Japan, Korea)*
- *DDTs(marine mammals in Japan, Russia)*
- *Organic Hg (Kyrgyzstan)*

Establishment of POPs Information Warehouse in East Asia

❖ 1st workshop (December, 2005)

- UNEP, AMAP & 7 countries were participated

❖ Future plan

- Reporting format (a first half of 2006)
  - develop a format (by NIER) and review by other countries
- Web construction(2006)
  - set up a new web-site or using existing web-site
- 2nd Workshop (October, 2006)
  - Finalize the standard format to collect data
- Operation and modification (2007~)

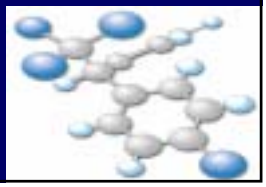
REACH Team - Activities

➢ **Objectives**

- To inform the chemical industry of REACH Legislation details
- To analysis the basic requirements for registration
- To secure the principal expertises necessary for compliance

➢ **Main Activities**

- Published the Understanding of REACH
- Advised MOE's Projects on REACH countermeasure:
- Analyzed the hot issues necessary for the trading industry
- To study the regulatory use of QSAR('06-)



Bilateral Research Cooperation (I)


➢ **Korea-Japan Joint Project on EDCs/POPs**

- Exchange of Agreement on Joint Project between NIER of Korea and NIES of Japan (Oct. '99)

⇒ **Ministerial Arrangement** on Joint Project of EDCs (Apr. 2001)

- Korea-Japan Cooperative Joint Seminar / Working Group Meeting

(1st Nov.25, '99 Korea/ 2nd Nov.9,2000 Japan/1st Dec.7, 2001 Korea/ 2nd Dec. 9, 2003 Japan 3rd Jan. 16, 2004, Korea/ 4th Jan 28,2005 Japan/ 5th Jan 19, 2006 Korea)

- Participation of International Symposium on EDCs

- Information exchange on Environmental Monitoring Data etc.


➢ **Korea-China Joint Project on Health Effect**

- Exchange of Agreement on Joint Project "health effect over Environment" between NIER of Korea and CESI of China (Mar.2001)

Bilateral Research Cooperation (II)

➢ **Korea-Japan Joint Project on EDCs/POPs**

- Development of the examination method using medaka
- Comparison of the levels of dioxin accumulation in in-land fish
- Standardization of wildlife monitoring methods
- Research on fate modeling of endocrine disrupters
- The comparison study on dioxin inventory estimation
- Harmonization for analytical methods of dioxins and other POPs between Korea and Japan

➢ **Korea-China Joint Project on Health Effect**

- Survey on influence factors of vital capacity of Korean vs. Chinese

National Information System of Chemicals

- URL : http://ncis.nier.go.kr
- Integrated system for chemical information
- Basic frame for Information Warehouse
- Web Service : Jan. 2006

Future Direction

❑ Strengthening Risk/Hazard Review System

♦ Increase reliability of Toxicity Test Data

- o Legal and institutional arrangement for GLP system
- o Strengthening the R&D capacity of NIER in Risk assessment
- o Designing and supporting Private GLP institutions

♦ Strengthening the hazardousness review for existing and new chemicals

- o Selection of target chemicals based on chemicals survey
  - Participation of OECD's SIDS Program
- o Strengthening toxic test requirements for new chemicals review

11 Toxic Tests are required

(Acute toxicity, chronic toxicity, etc.)

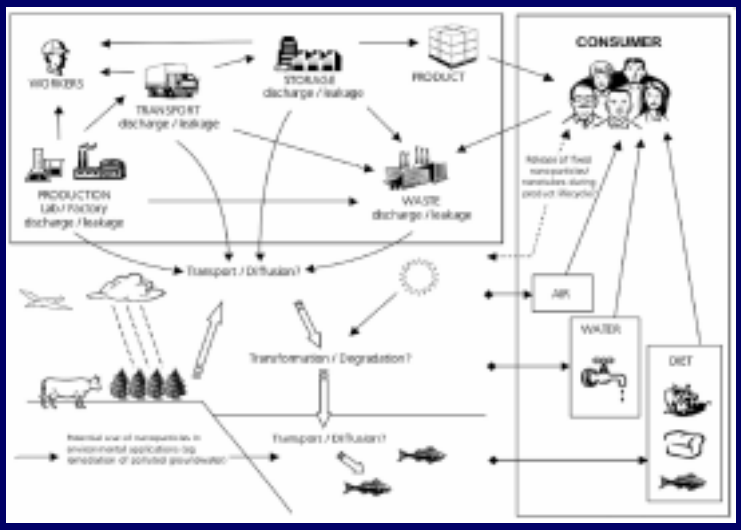
➡

OECD's Minimum Pre-market Set Data Requirements

Future Works & Challenges

- Continuous researches in accordance with the research plan
  - *Need scientifically agreed Screening /Test Methods to make the research plan to progress*
  - *Selection of chemicals of concerns for risk management actions*
- Strengthening Local, Regional & International Cooperation
  - *Government, Research Institutes, Industries, NGO etc*
  - *Make full use of cooperative researches to save resources & avoid duplication*
  - *bi-lateral &multi-lateral cooperation efforts for harmonized approach*
- Risk Reduction Measure for Hazardous Chemicals
  - *Enactment of chemicals related law under Rotterdam/Stockholm Convention*

Possible Release Paths of Nanoparticles

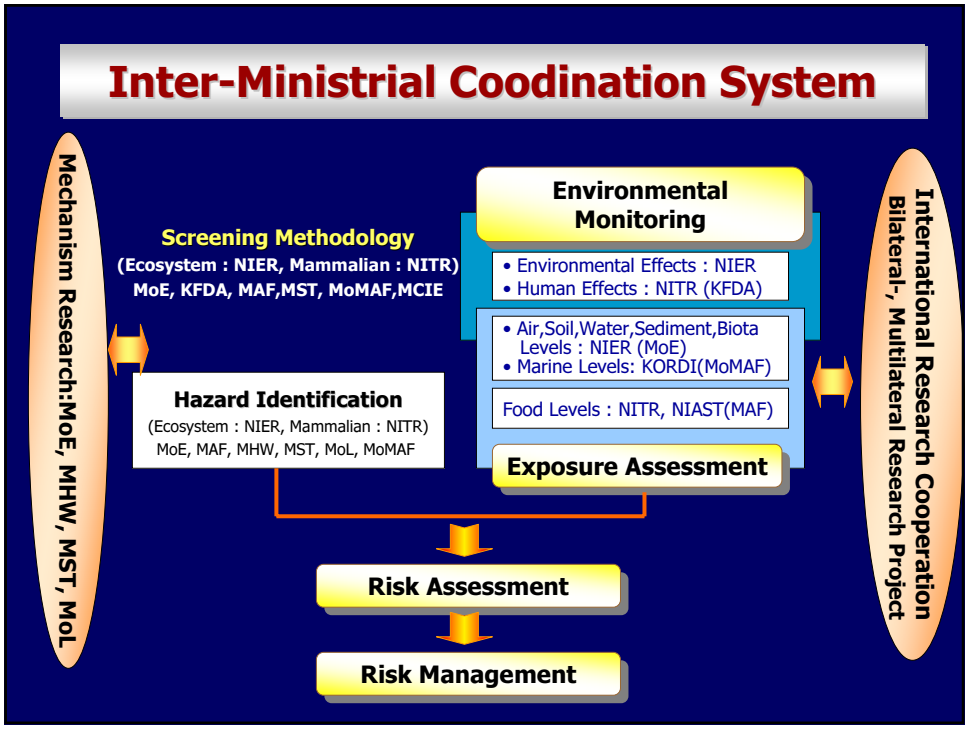


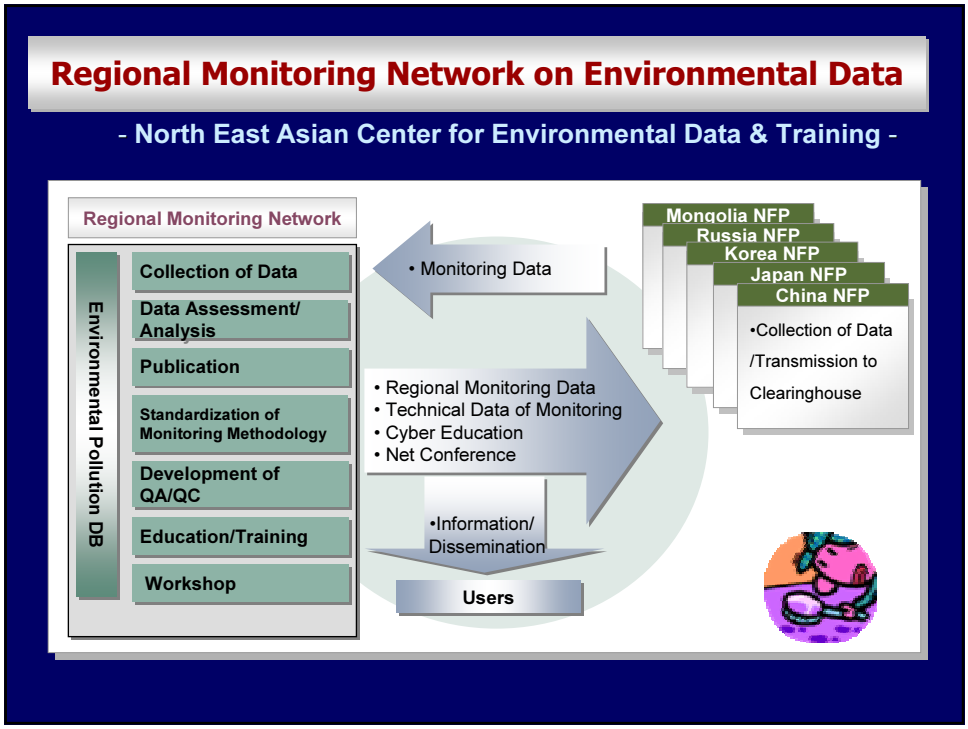
Inherent Risks of Nanotechnological Fields

Materials / Powders	Nanobio / NanoMedicine	Devices	Instrumentation	Nanofactory / Replication
- Novel Materials - Nano Particles - Surfaces	- Biomaterials - Life Sciences	- Optical Devices - Light Sources - Sensors - Energy Storage - Photovoltaics	- Tips and Probes - Data Storage	- Machining - Self Assembly
Environmental Risks	Environmental Risks	Environmental Risks	Environmental Risks	Environmental Risks
Toxicity	Toxicity	Toxicity	Toxicity	Toxicity
Societal Impacts	Societal Impacts	Societal Impacts	Societal Impacts	Societal Impacts
Economic uncertainty	Economic uncertainty	Economic uncertainty	Economic uncertainty	Economic uncertainty

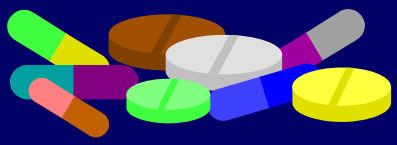
No or little risks | Medium risks | High risks

source: TEMAS AG

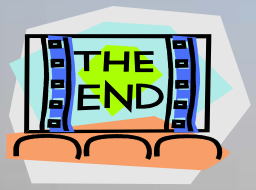

Inter-Ministrial Coodination System
Mechanism Research:MoE, MHW, MST, MoL
Screening Methodology
(Ecosystem : NIER, Mammalian : NITR)
MoE, KFDA, MAF,MST, MoMAF,MCIE
Hazard Identification
(Ecosystem : NIER, Mammalian : NITR)
MoE, MAF, MHW, MST, MoL, MoMAF
Environmental Monitoring
• Environmental Effects : NIER
• Human Effects : NITR (KFDA)
• Air,Soil,Water,Sediment,Biota Levels : NIER (MoE)
• Marine Levels: KORDI(MoMAF)
Food Levels : NITR, NIAST(MAF)
Exposure Assessment
Risk Assessment
Risk Management
International Research Cooperation
Bilateral-, Multilateral Research Project


Regional Monitoring Network on Environmental Data
- North East Asian Center for Environmental Data & Training -
Regional Monitoring Network
Environmental Pollution DB
Collection of Data
Data Assessment/ Analysis
Publication
Standardization of Monitoring Methodology
Development of QA/QC
Education/Training
Workshop
• Monitoring Data
• Regional Monitoring Data
• Technical Data of Monitoring
• Cyber Education
• Net Conference
•Information/ Dissemination
Users
Mongolia NFP
Russia NFP
Korea NFP
Japan NFP
China NFP
•Collection of Data /Transmission to Clearinghouse

All substances are poisons;
there is none which is not a poison.
The right dose differentiates a poison from a remedy.



- Paracelsus
(1493-1541)



Thank You !!!

中国汽车排放污染与可持续发展的关键问题

Vehicle Emissions Pollution and Key Issues for the Sustainable Development in China

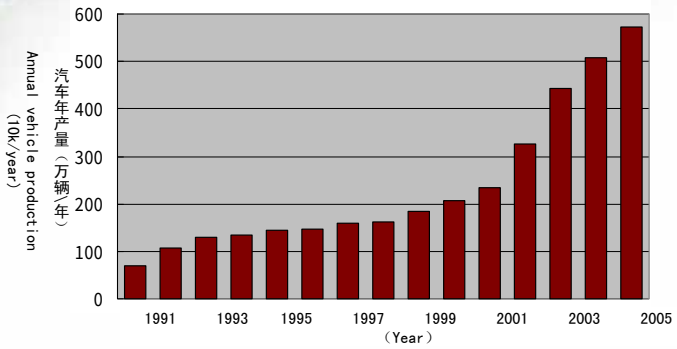
中国环境科学研究院

Chinese Research Academy of Environmental Sciences

主要内容 Contents

1. 中国汽车增长状况
   China's vehicle population growth
2. 中国车用燃料消费状况和消费结构
   China's vehicle fuels consumption and its structure
3. 中国汽车排放污染的总体情况
   Overall situations of China's vehicle emission pollution
4. 汽车工业可持续发展的关键问题
   Key issues of auto industry's sustainable development
5. 汽车污染控制领域的研究项目简介
   Introduction to research projects in field of vehicle emission pollution control

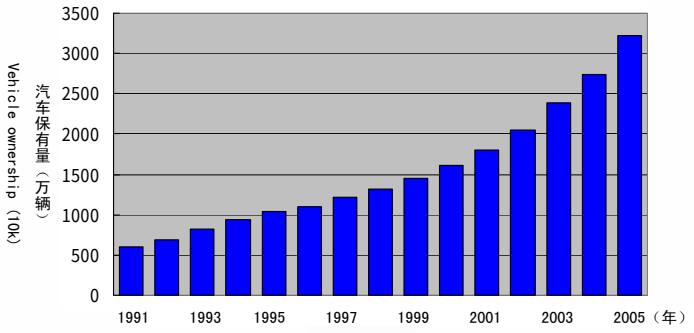
中国汽车年产量变化状况(万辆)
China's Annual Vehicle Production (AP) (10k)



Year	AP	Year	AP	Year	AP
1991	70	1996	147	2001	234
1992	106	1997	158	2002	325
1993	130	1998	163	2003	444
1994	135	1999	183	2004	507
1995	145	2000	207	2005	573

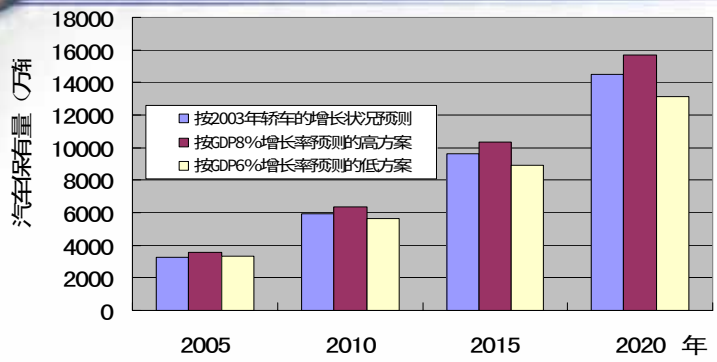
中国汽车保有量增长状况(万辆)
China's Vehicle Ownership Growth (10k)

年份 Year	保有量 Ownership	年份 Year	保有量 Ownership	年份 Year	保有量 Ownership
1991	606	1996	1100	2001	1802
1992	692	1997	1219	2002	2053
1993	818	1998	1319	2003	2383
1994	942	1999	1453	2004	2742
1995	1040	2000	1609	2005	3216



中国汽车保有量增长趋势预测(万辆)

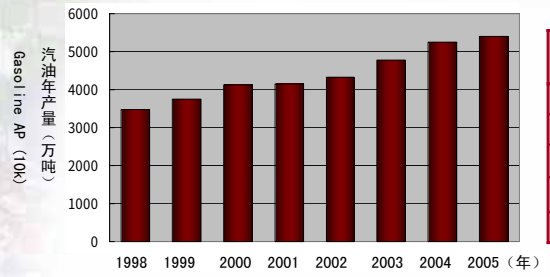
Forecast of China's Vehicle Ownership Growth (10k)



预测方案 Scenario / 年份 Year	按03年汽车增长状况预测 By growth rate in 2003	按GDP8%增长率预测 as GDP growth at 8%	按GDP6%增长率预测 as GDP growth at 6%
2005	3264.5	3554	3356
2010	5937.9	6351	5669
2015	9633.2	10315	8905
2020	14509	15683	13103

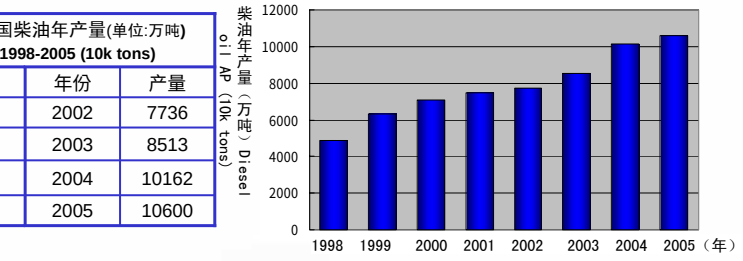
中国汽油、柴油年产量变化状况(万吨)

China's Annual Production of Gasoline and Diesel Oil (10k tons)



1998-2005年中国汽油年产量(单位:万吨) Gasoline AP 1998-2005 (10k tons)			
年份	产量	年份	产量
1998	3465	2002	4336
1999	3741	2003	4770
2000	4135	2004	5250
2001	4155	2005	5400

1998-2005年中国柴油年产量(单位:万吨) Diesel oil AP 1998-2005 (10k tons)			
年份	产量	年份	产量
1998	4884	2002	7736
1999	6303	2003	8513
2000	7080	2004	10162
2001	7486	2005	10600

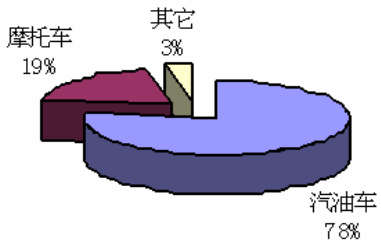


2004年中国汽油、柴油的消费结构

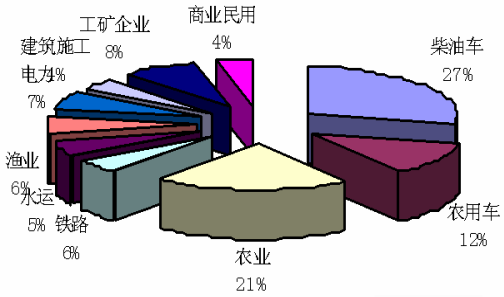
Consumption Structure of Gasoline and Diesel Oil in China in 2004

2004年中国汽油产量的78%用于汽油车，19%用于摩托车，其他消费了3%。
78% of gasoline produced in 2004 was consumed by gasoline vehicles, 19% by motorcycles and others 3%.

2004年国内汽油消费结构



2004年国内柴油消费结构



2004年中国柴油产量的27%用于柴油车，12%用于农用车，其他消费了61%。
27% of diesel oil produced in 2004 was consumed by diesel vehicles, 12% by agricultural vehicles and 61% by others.

中国汽车排放污染现状

China's Present Vehicle Emission Pollution Situations

● 随着汽车保有量的快速增长，污染物排放总量也在持续攀升。2003年全国机动车排放的一氧化碳、碳氢化合物和氮氧化物的总量是1995年的2.05、2.51和3.01倍。

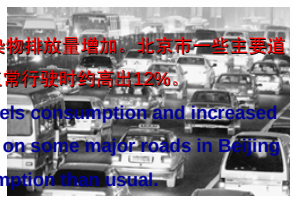
Pollutants emitted from vehicles increase as vehicle ownership grows. Vehicle emitted CO, HCs and NOx countrywide in 2003 were 2.05, 2.51 and 3.01 times as high as in 1995.

● 部分大城市机动车排放污染物已经成为城市空气污染的主要来源。北京、上海、广州等大城市机动车排放的一氧化碳和碳氢化合物所占比例都在80%以上；深圳市机动车排放的氮氧化物、碳氢化合物和一氧化碳分别占排放总量的64.9%、70.6%和94.5%。

Vehicle emission pollution has become the major sources of urban air pollution in some large cities. CO and HCs from vehicle emissions account for over 80% in Beijing, Shanghai and Guangzhou; while 64.9% of NOx, 70.6% of HCs and 94.5% of CO come from vehicle emissions in Shenzhen.

● 由于交通堵塞，平均车速降低，燃油消耗量增加，使污染物排放量增加。北京市一些主要道路在交通高峰时平均车速仅为11公里，汽车燃油消耗量比正常行驶时约高出12%。

Traffic causes low transport speed, resulting in high fuels consumption and increased pollution emissions. Average speed during rush hours on some major roads in Beijing is only around 11km/h, causing 12% more fuels consumption than usual.



关键问题之一：常规动力装置的改进与优化

Key Issue No. 1: Retrofit and Optimization of Regular Technologies

分类 Categories		技术对策 solutions	实施方法 approaches	控制对象 target pollutants
常规动力装置 Regular	汽油机 Gasoline engine	电控汽油喷射 EFI	单片机反馈控制工作参数 SCM control	CO、HC、NOx
		燃烧系统优化 Combustion system optimization	改善燃烧室形状和气流运动 Combustion Chamber and air flow improvement	CO、HC、NOx
		进气系统优化 Intake system optimization	VVT and VIS 可变进气系统、可变配气相位	HC、CO、NOx
		废气再循环 EGR	中冷EGR、内部EGR cooled EGR, internal EGR	NOx

关键问题之一：常规动力装置的改进与优化

Key Issue No. 1: Retrofit and Optimization of Regular Technologies

分类 Categories		技术对策 Technical solutions	实施方法 Approaches	控制对象 Target pollutants
常规动力装置 Regular	柴油机 Diesel Engine	供油系统 Fuel supply system	电控高压油泵，共轨系统，泵喷嘴 Electronically controlled high pressure fuel pump, common rail, pump injector	PM、NOx
		喷油规律改进 Fuel injection improvement	喷油曲线形状，预喷射，多段喷射 Fuel curve shaping, pilot injection, multiple injection	NOx、PM
		燃烧室设计 Combustion chamber design	优化燃烧室设计参数 Optimization	NOx、PM
		进排气系统 Intake/exhaust system	进排气动态效应，多气门配气机构 Intake and exhaust dynamic effects, multi valve system	PM
		增压装置 Turbo charge	增压中冷，可变截面涡流喷嘴 charge inter-cooling, VATN	PM
		废气再循环 EGR	中冷EGR、内部EGR cooled EGR, internal EGR	NOx

关键问题之二：开发研制后处理装置
Key Issue No. 2: R&D of after-treatment devices

分类	技术对策solutions	控制对象target pollutants	应用状况application
汽油机 Gasoline	氧化催化器OCC	CO、HC	轿车上已较少，重型汽油车有应用few on PC, some HD gasoline vehicles
	还原催化器RCC	NOx	已很少用rare
	三元催化器TWC	CO、HC、NOx	应用广泛，轿车和轻型车必备装备 extensive, PC and LD vehicles
	稀燃催化器 Lean burning CC	稀燃条件下的NOx、CO、HC from lean burning	少量开始应用，继续研制开发中few, R&D on-going
柴油机 Diesel	氧化催化器OCC	SOF，CO、HC	少量开始应用few, starting
	还原催化器RCC	NOx	研制开发中under R&D
	微粒捕集器DPF	PM	研制开发及中试阶段R&D, test run
	碳纤维吸附净化 Carbon fiber adsorption	NOx	基础研究中under research

关键问题之三：改进常规燃料质量、开发新型能源
Key Issue No. 3: Improve regular fuels quality and develop new energy

分类	技术对策 solutions	效果与应用 impacts and application
常规燃料 Regular fuels	降低硫含量 lower sulfur	降低CO、HC、NOx以及PM，目前正在研究和应用中 lower CO, HC, NOx and PM emissions, under research and application
	合理组分 proper blending	
	添加剂与清净剂 additives and detergents	
新能源 New energy	压缩天然气（CNG）	降低CO、HC排放，城市公交车 lower CO and HC emissions, urban public buses
	液化石油气（LPG）	降低CO、HC排放，部分出租车 lower CO and HC emissions, some taxi
	已醇汽油（E10）	降低CO、HC排放，部分省市 lower CO and HC emissions, some areas
	甲醇燃料（M10-M100）	研究中，有毒、甲醛排放、腐蚀 under research, poisonous, formaldehyde emission, corrosion
	二甲醚 dimethyl ether	研究中under research
	氢燃料（H_2）	研究中under research

关键问题之四：开发新型动力装置
Key Issue No. 4: Develop new power-providing device

指标 / 动力装置	设备投入 investment	综合成本 cost	经济效益 benefit	续行里程 Mileage	排放水平 emission	技术成熟度 Tech. maturity
纯电力 electricity	较大big	较低low	较好good	短poor	零排放 zero	较高relatively high
混合动力 hybrid	大large	较高 relatively high	较好good	长good	低排放low	高high
燃料电池fuel cell	大large	高high	差poor	长good	超低排放 ultra low	较低relatively low
太阳能solar energy	较大big	高hige	较差 relatively poor	短poor	零排放 zero	低low

汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

一、汽车后处理装置开发研制
R&D of after-treatment devices

1.汽油车电加热快速起燃装置和高效催化转化器

Gasoline vehicles: electrical-heating fast light-up device and high-performance TWC

开发满足中国第Ⅳ阶段汽油车排放标准的高效三元催化剂、陶瓷或金属载体、电加热快速起燃装置和OBD

R&D high performance TWC that could meet China's Phase IV gasoline vehicle emission standards, ceramics or metals carrier matrix, electronic-heating fast light-up device and OBD system

2.柴油车颗粒捕集器和还原催化器

Diesel vehicles: DPF and SCR

开发满足中国第Ⅳ、Ⅴ阶段柴油车排放标准的颗粒捕集器和再生装置以及还原催化器

R&D DPF and regeneration device and SCR that could meet China's Phase IV, V diesel vehicle emission standards

汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

二、车用汽油及汽油清净剂对排放影响的基础研究
Basic research on impacts of vehicle gasoline and gasoline detergents on vehicle emissions

1.车用汽油组份对汽车排放的影响

Impacts of gasoline components on vehicle emissions

重点研究车用汽油的硫含量、烯烃和芳烃的比例对汽车排放的影响，适合不同排放标准的硫含量以及合理的烯烃和芳烃的比例。

Focus on the impacts of vehicle gasoline sulfur content, olefin content and aromatics content on vehicle emissions; sulfur contents that could meet different vehicle emission standards and appropriate olefin and aromatics contents/ratio.

2.汽油清净剂的作用机理以及对汽车性能的影响

Function mechanisms of gasoline detergents and its impacts on vehicle emissions

重点研究汽油清净剂对进气阀沉积物和燃烧室积碳的净化机理以及使用清净剂后对发动机动力性、经济性和汽车排放性能的影响。

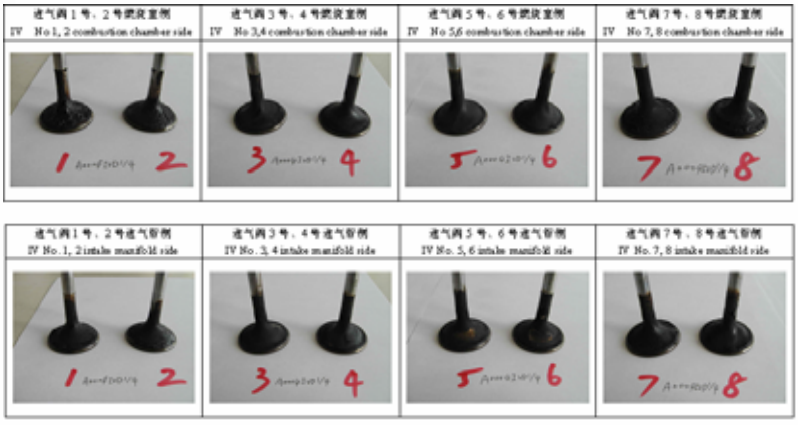
Focus on the cleaning mechanism of gasoline detergents over IVDs and CCDs, and the impacts of application of detergents on engine drivability, fuel economy and vehicle emissions.

汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

3.部分汽油清净剂的作用机理的研究结果

Functioning results of some gasoline detergents

3.1基础油 Base fuel



汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

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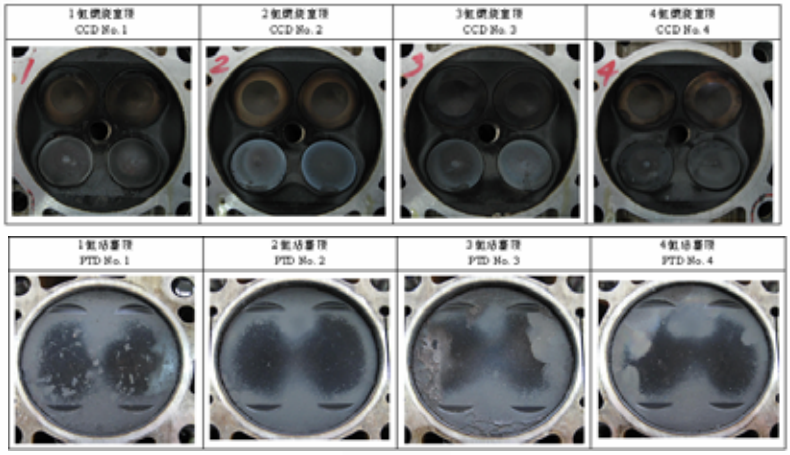
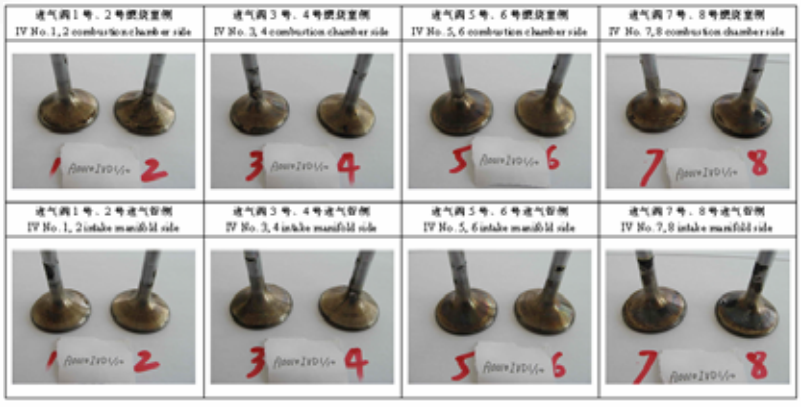


汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

3.部分汽油清净剂的作用机理的研究结果

Functioning results of some gasoline detergents

3.2添加清净剂的汽油 Additized gasoline



汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

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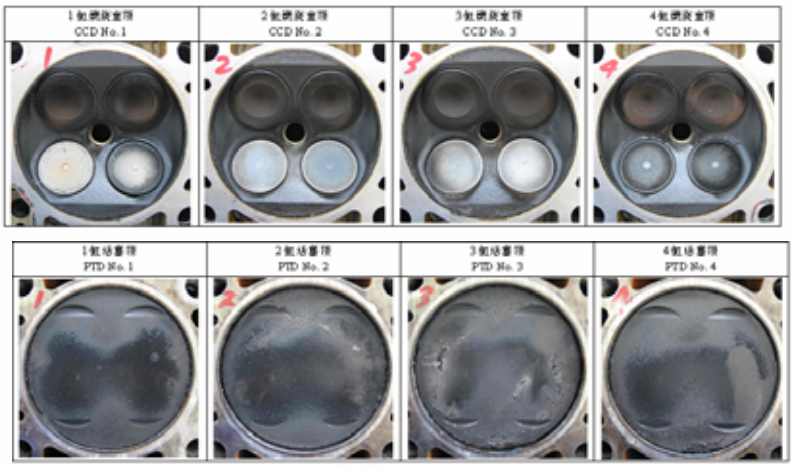


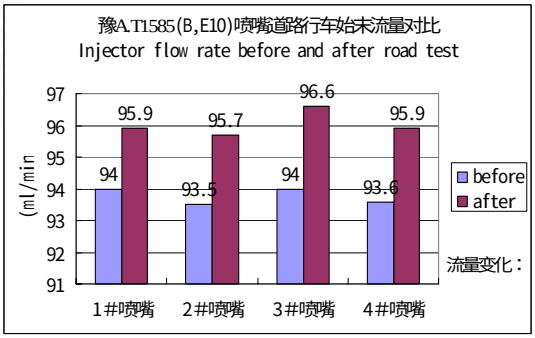
汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

三、车用已醇汽油(E10)对汽车性能影响研究

Impacts of gasohol (E10) on vehicles

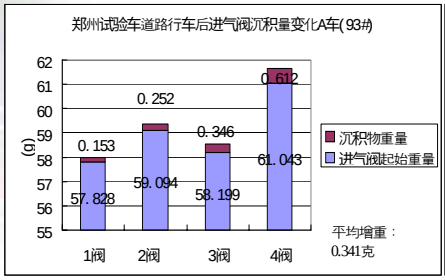
1. E10已醇汽油喷嘴流量特性的影响

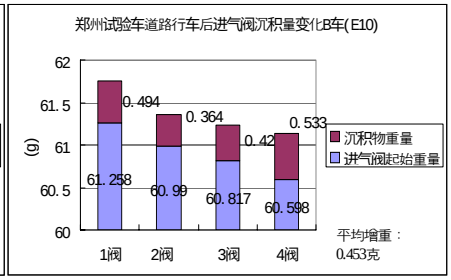
Impacts of E10 gasohol on fuel injector flow rate



汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

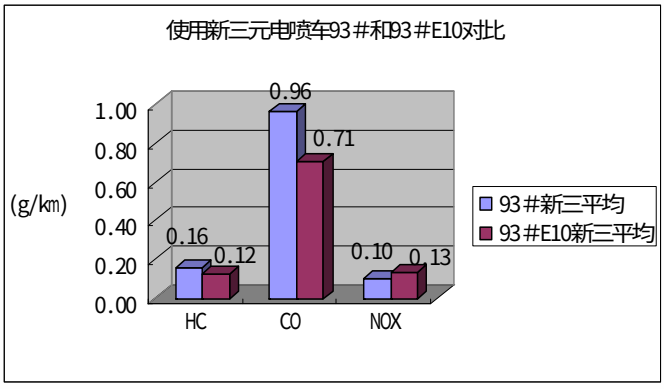
2.进气阀沉积物变化状况　IVD changes





汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

3.排放污染物变化状况　Pollutants emission change



汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

四、在用汽车排放检测方法研究
Research on in-use vehicles emission test methods

1.检测方法 Test methods

自2005年7月1日起，在全国范围内最低使用双怠速法对在用汽车实行定期检测，机动车保有量较多、污染严重的城市可使用稳态工况法、瞬态工况法、简易瞬态工况法和加载减速法检测。

From July 1, 2005 on, at least two-speed idle method must be used for in-use vehicles regular test countrywide; for cities that have large vehicle ownership and seriously polluted air quality, ASM, IM195, Vmas and Lugdown methods may be used for in-use vehicles regular tests.

汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

2.检测设备评价研究 Test equipment evaluation research

对稳态工况法、瞬态工况法、简易瞬态工况法和加载减速法所用的底盘测功机、废气分析仪、流量计和控制系统等检测设备进行综合评价，提出选用标准。指导地方环保部门开展在用汽车排放检测工作。

To evaluate chassis dynos, exhaust analyzers, flow-rate meters and control systems etc. used for ASM, IM195, Vmas and Lugdown methods and issue qualification and application guidelines. Guide local EPBs implementing in-use vehicles emission test work.



汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

3.技术规范研究 Technical guidelines research

主要研究在用汽车排放检测机构的质量控制规范和运营技术规范，为地方环保部门开展在用汽车排放检测工作提供技术支持。Research on quality control and operation guidelines for in-use vehicles emission test organizations, supporting local EPBs in carrying out in-use vehicles emission test work.

主要内容包括：Including

检测机构建设要求；qualification requirements;

检测质量管理体系；test quality management systems;

机构运行管理制度；operation procedures;

检测人员培训考核规范；personnel training and examination guidelines;

监督管理技术规范。Supervision and management guidelines.

汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

五、机动车污染控制机制研究
Policy research of vehicle emission pollution control

1.中国机动车污染监督管理条例研究

Ordinance of Vehicle Emission Pollution Control in China

《机动车排放污染监督管理条例》由国家环保总局负责，中国环科院是主要起草单位，目前已经完成了《条例》的编写论证和征求意见，并向国务院法制办报送了草案。The Ordinance was initiated by SEPA and drafted by CRAES. At present, the Ordinance has been peer-reviewed and circulated for opinions and submitted to the Office of Rule of Law of the State Council.

该《条例》是继《大气污染防治法》之后的一部最完善的机动车污染监督管理法规。其范围涵盖：在中国境内制造、进口、销售、使用和维修机动车，以及生产、进口、销售和使用车用燃料的单位和个人；其内容包括：新机动车、在用机动车、车用燃料、报废机动车的回收与利用等方面。The Ordinance is the most comprehensive regulation for vehicle emission pollution supervision and management after the effectiveness of the Law of Air Pollution Prevention and Control of the PRC. It regulates manufacture, import, sales, use and I/M, repair of vehicles within China; organizations and personals that operate the above activities. It covers new vehicles, in-use vehicles, vehicle fuels, disposal and recycling of scrapped vehicles, etc.

汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

2.汽车排放法规标准研究

Laws, regulations and standards concerning vehicle emission pollution control

已经完成的主要排放法规标准：accomplished laws, regulations and standards

机动车安全运行技术条件（GB7258-2004）Safety specifications for power-driven vehicles operating on roads

轻型汽车第Ⅲ、Ⅳ阶段排放标准（GB18352.3-2005）Limits and measurement methods for emissions from light-duty vehicles (III, IV)

重型汽车第Ⅲ、Ⅳ、Ⅴ阶段排放标准（GB17691-2005）Limits and measurement methods for exhaust pollutants from compression ignition and gas fuelled positive ignition engines of vehicles (III, IV, V)

在用汽油车排放标准（GB18285-2005） Limits and measurement methods for exhaust pollutants from vehicles equipped ignition engine under two-speed idle conditions and simple driving mode conditions

在用柴油车排放标准（GB3847-2005） Limits and measurement methods for exhaust smoke from C.I.E. (Compression Ignition Engine) and vehicle equipped with C.I.E.

汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

2.汽车排放法规标准研究

Laws, regulations and standards concerning vehicle emission pollution control

正在研究的主要排放法规标准：Laws, regulations and standards under research

轻型汽车第Ⅴ阶段排放标准（中美日欧三国四方合作机制）Phase V emission standards for light duty vehicles (cooperation between China, US, Japan and EU)

重型汽车排放控制装置耐久性标准Durability standards for emission control devices of heavy duty vehicles

通用小型汽油机排放标准(第Ⅰ、Ⅱ阶段)emission standards for universal small gasoline engines (Phase I, II)

非道路移动机械排放及烟度标准(第Ⅰ、Ⅱ阶段)Emission and smoke standards for non-road machineries (Phase I, II)

摩托车和轻便摩托车第Ⅲ阶段排放标准Emission standards for motorcycles and mopeds (Phase III)

汽车污染控制研究项目简介
Introduction to Vehicle Emission Pollution Control Research Projects

3.汽车污染控制方法研究 Vehicle emission pollution control strategies

新生产机动车的达标申报和生产一致性检查；

Newly manufactured vehicles environmental protection type approval application and COP inspection;

在用机动车的定期检查维修、标志制度，以及符合性检查制度；

regular I/M and labeling for in-use vehicles and in-use compliance inspection;

车用燃料的有害物质控制；

Control of hazardous substances in vehicle fuels;

燃料添加剂的登记申报制度；

vehicle fuels additives registration system;

报废机动车的回收与利用政策。

Disposal and recycling of scrapped vehicles.

谢 谢！

Thank you

中国环境科学研究院

Chinese Research Academy of Environmental Sciences

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Priority Program
Asian Environmental Research Program in NIES
-Working Towards Coexistence with Nature-

Hideaki NAKANE
Director
Asian Environmental Research Group
National Institute for Environmental Studies

For the 3rd Tripartite Presidents Meeting in May 2006 (Jeju)

Background
Five year's R&D Strategy of the Ministry of the Environment

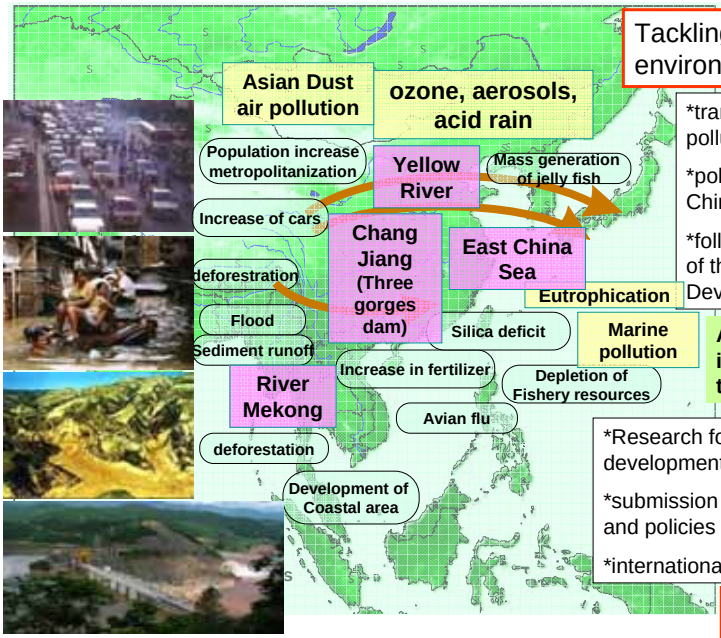
Future society to be established in Japan;
Sustainable Society

4 aspects of sustainable development
***Society that exits from inducing global warming**
***Recycling society**
***Society that is harmonious with nature**
***Safe and secure society**

Efforts for international contributions and cooperation

R&D related to the Asian environment, solving the environmental problems and international cooperation is encouraged.

On "harmonious with nature"
It is necessary to establish a society in which harmonious coexistence of nature and humans will be enabled by sound ecosystem accompanied by high quality water and atmospheric environment.



Tackling with environmental problems

*transboundary air pollution

*pollution in the East China Sea

*follow-up of sustainability of the Mekong Basin Development

Asian Environment is common issue for the three countries

*Research for sustainable development in Asia

*submission of technology options and policies

*international research network

International cooperation

Asian Environmental Research Program

Core projects

(1) Development of the methods for evaluating atmospheric environment in Asia

***transboundary and regional air pollution, observation network, Asian Dust observation, airborne observation, estimation of chemical reactions in air-mass**

***multi-scale numerical models, improvement of emission inventories, future prediction of atmospheric environment by chemical climate models**

(2)Development of the systems for evaluating regional water and material cycles in East Asia

***comprehensive measurements to evaluate water and material cycles, modeling, evaluation of impacts of change in water and material cycles and their future prediction**

***development of technology inventories of environmental management, index system to evaluate sustainability of watershed environment, evaluation and design of policy**

(3)Development of the methods for evaluating watershed environmental impacts

***understanding degradation of watershed ecosystem, development of watershed ecosystem database, investigation of methods for watershed ecosystem management**

***Scientific base for Asian Environmental management policy**

***Development of tools for environmental management**

***Creation of concept of the future Asian Environment**

***Research network**

Summary of the Core Project 1 (PJ1)

Development of the methods for evaluating atmospheric environment in Asia

Project Leader; T. Ohara (Asian G.)

Leading Scientists of PJ1;

- **S. Hatakeyama (Asian G.); observational studies on gases and aerosols**
- **T. Ohara (Asian G.); modeling, emission inventories, predictions**
- **M. Nishikawa (Lab. for IFES) and N. Sugimoto (Atmos. Env. Div); Asian Dust (Yellow Sand)**

***Integration of observational and model studies will make considerable progress during this 5 years project term in NIES.**

(continued)

- **Establishing in-situ observation sites for multiconstituent/continuous observation of atmospheric gases and aerosols and expanding the lidar and in-situ observation network of the Asian Dust (Yellow Sand) to include Mongolia and Southeast Asian Regions.**
- **Performing intensive observations by aircraft in China and Japan. (It was carried out in April 2006)**
- **Establishing database from this project and joint research.**
- **Establishing a method for understanding the big picture of wide area atmospheric pollution through multi-scale numerical modeling and observation databases.**
- **Combining bottom-up and top-down methods for analyzing observational data by using numeric models to improve emission inventories for atmospheric pollutants.**
- **Developing chemical climate models to forecast the state of the Asian atmospheric environment to 2030.**

- **Tools developed in the projects (observational sites, analysis systems, models) will be used by scientists involved in international cooperation.**
- **A technical meeting focused on these "tools" should be fruitful as one of the activities of TPM3.**

Summary of the Core Project 2 (PJ2)

Development of the systems for evaluating regional water and material cycles in East Asia

Leader; Wang Qinxue

•Improving remote sensing technology to assess wide area water and material cycles, developing new observation methods, and using these methods to create integrated observation systems.

•Creating an East Asia environmental information database that includes information on water, heat, and material cycles based on satellites, GIS, and observational data.

•Investigating the correlations among complex impact processes such as wide area climate, land forms, and terrestrial cover to develop an assessment model for water and material cycles.

•Evaluating and predicting the effects of changes in the land and climate on water cycles (such as water shortages and floods) and material cycles (such as carbon, nitrogen etc.).

•Consolidating a technology inventory system for sustainable environmental management and developing socio-environmental indicators for assessing sustainable urban and watershed environments. The system provides strategic design and evaluation of appropriate technology alternatives and countermeasure policy programs for the local and regional stakeholders.

Summary of the Core Project 3 (PJ3)

Development of the methods for evaluating watershed environmental impacts

Leader; Seiichi Nohara

•Making high resolution land cover classification maps of certain areas and maps to assess wetland function and using them to understand natural deterioration in watershed ecosystems.

•Collecting data on the diversity of major organisms, ecological information, and climate and water quality to make an environmental database of watershed ecosystems.

•Collecting water environment data essential to environmental impact assessment and using it for modeling. Developing landscape ecology methods to evaluate suitable habitats and methods to evaluate impacts on estuary ecosystems that can be used in watershed ecosystem management.

Long-range Transport of Atmospheric Pollutants and Aerosols in East Asia

Asian Environmental Research Group
National Institute for Environmental Studies

By S. Hatakeyama

On-Going International Activities Participated

- EANET (Acid Deposition Monitoring Network in East Asia)
  13 East Asian Countries
- LTP (Long-range Transboundary Air Pollutants in Northeast Asia)
  Korea (MOE, NIER), Japan (MOE, ADORC, NIES)
  China (SEPA, CRAES)
- ABC (Atmospheric Brown Clouds – Asia)
  UNEP

Observation sites participated in **ABC-EAREX 2005 Campaign.**

Hedo was one of important observation sites.

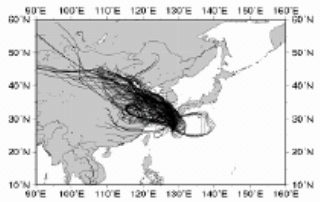
Aerosol Mass Spectrometer (AMS)

TEOM and EC/OC Monitor

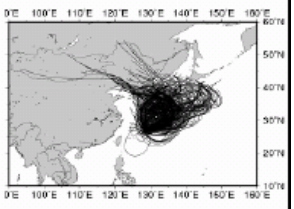
Instruments for radiation monitoring

Back trajectory calculations and classification of trajectories

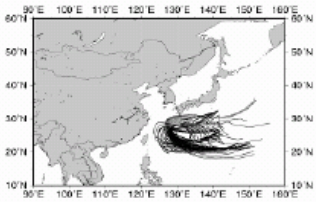
China Origin(04.3~05.1.)



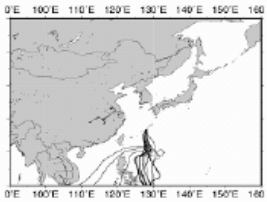
Jpn&Kor Origin(04.3~05.01.)



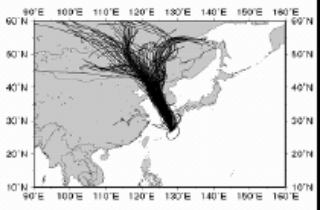
P.Ocean Origin(2004.5~6.)



SE-Asia Origin(2004.5~6.)

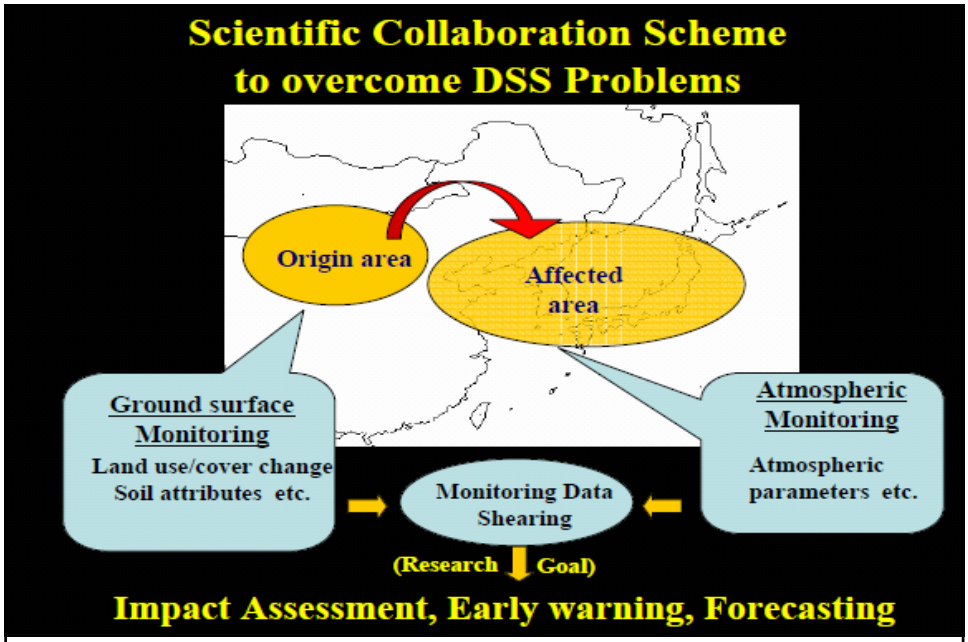


NE China Origin(04.12~05.1.)

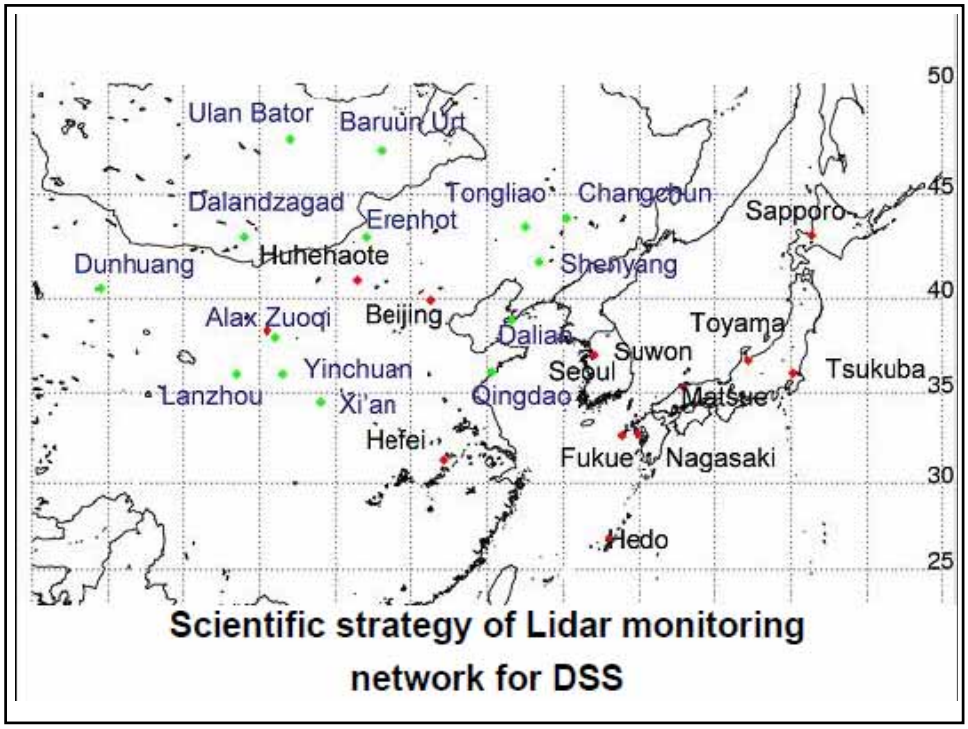


Preliminary results on elementary carbon, organic carbon in aerosols

1. EC/OC ratio was high in the air mass of China origin.
2. EC showed better correlation with sulfate suggesting that emission from coal combustion is still high in China.
3. Organics transported to Okinawa were photo-chemically produced and extensively oxidized.
4. OC was high in warm seasons, but it can be removed by precipitation. That means water-soluble components are contained in OC.



Collaboration proposed by Dr. M. Nishikawa (NIES, Japan) for research on dust and sandstorm (DSS)


Ulan Bator
Baruun Urt
Dalandzagad
Erenhot
Tongliao
Changchun
Sapporo
Dunhuang
Huhehaote
Shenyang
Alax Zuoqi
Beijing
Dalian
Toyama
Suwon
Seoul
Tsukuba
Yinchuan
Lanzhou
Xi'an
Qingdao
Matsue
Hefei
Fukue
Nagasaki
Hedo
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Scientific strategy of Lidar monitoring network for DSS


17 Apr. '06 Beijing (by Nishikawa)
(by Asahi.com)
18 Apr. '06 Tokyo (by Asahi Press)
24 Apr. '06 Seoul (by JoongAnglibo.com)
Heavy DSS attacked three capitals in the springtime, 2006

Lidars in the Network for DSS observation

Session 3 Presentations

Review of the 1st and 2nd TPM

May 17, 2006

Kim Myungjin (金命振)

National Institute of Environmental Research

3rd Tripartite Presidents Meeting
Jeju, Korea, May 17, 2006

Outline of Presentation

- Outcome of the 1st TPM in Beijing
- Working Level Meeting for the 2nd TPM
- Outcome of the 2nd TPM in Tsukuba
- Working Level Meeting for the 3rd TPM
- Today's Discussion

3rd Tripartite Presidents Meeting
Jeju, Korea, May 17, 2006

Outcome of the 1st TPM in Beijing

Time: Feb. 16-17, 2004

Venue: Kunlun Hotel Beijing

- **Information Exchange regarding Institutional Structure and Ongoing Research Activities**
- **Exchange Views on Future Environmental Issues and Future Possible Cooperation under TPM**
- **Communique**

3rd Tripartite Presidents Meeting
Jeju, Korea, May 17, 2006

Communique of the 1st TPM

- **Cooperation Strengthening through Exchange of Information and Personnel**
- **Hold TPM Meeting at Regular Basis**
- **Hold Workshop on Specific Topics on the Occasion of TPM**
- **Working Level Meeting Setup for TPM and Joint Projects**

3rd Tripartite Presidents Meeting
Jeju, Korea, May 17, 2006

Working Level Meeting for the 2nd TPM

Time: August 25-27, 2004

Venue: Tsukuba, NIES

- **Agenda of the 2nd TPM and**
- **TPM Workshop as an Associated Event**
- **Preliminary Program including the Workshop**

3rd Tripartite Presidents Meeting
Jeju, Korea, May 17, 2006

Outcome of the 2nd TPM in Tsukuba

Time: October 12-14, 2004

Venue: Epo-Chal, Tsukuba

- **Discussion of Recent Research and Further Cooperation Activities**
- **Agreed Six Joint Projects:** 1. Freshwater Pollution 2. Air Pollution including Vehicular Sources, 3. Transboundary Air Pollution, 4. Yellow Sand Storm, 5. Hazardous Materials Contamination 6. Migratory Birds and Wetland
- **TPM Homepage Development**
- **Introduction of Kindred Research Bodies**
- **Project Development through Working Level Meeting**
- **Workshop on Freshwater Pollution Prevention**
- **Communique**

3rd Tripartite Presidents Meeting
Jeju, Korea, May 17, 2006

Communique of the 2nd TPM

- Agreed Six Joint Projects
- Information Exchange: TPM Homepage Development and Publications Exchange
- Project Development through Working Level Meeting
- Expanding TPM to Include Kindred Research Bodies

3rd Tripartite Presidents Meeting
Jeju, Korea, May 17, 2006

Working Level Meeting for the 3rd TPM

Time: September 21-23, 2005
Venue: Seogwipo KAL Hotel

- Decision of Proposed Date of the 3rd TPM
- Information and Personnel Exchange
- Focal Points of Six Joint Projects
- Subject of TPM3 Workshop on Air Pollution
- of Kindred Institute as an Observer after TPM4

3rd Tripartite Presidents Meeting
Jeju, Korea, May 17, 2006

Today's Discussion

- Focal Points for Proposed Joint Projects
- Designation of Focal Points for Information Exchange
- Exchange of Researchers
- Suggestions on the Ongoing Joint Projects
- Candidate for Additional Member Countries
- Discussions on the TPM4
- Suggestion of Additional Cooperation Projects
- Others

3rd Tripartite Presidents Meeting
Jeju, Korea, May 17, 2006

會三歸一

TPM for World Happiness


THANKS
SEE YOU IN CHINA

Progress Report and Action Plan for TEMM agreed Fresh Water (Lakes and Marshes) Pollution Control Project

Yuhei INAMORI, Kai-Qin XU and Yoshitaka EBIE

National Institute for Environmental Studies

E-mail: inamori @ nies.go.jp, joexu @nies.go.jp, ebie.yoshitaka@nies.go.jp

The purpose of this project was to establish an appropriate countermeasure for watershed management for maintenance and the reproduction of lakes and marshes under the cooperation among the three national environmental organizations of Japan, China and Korea, i.e., National Institute for Environmental Studies (NIES), Chinese Research Academy of Environmental Sciences (CRAES), National Institute for Environmental Research Academy (NIER).

In addition, it is important to promote the Asia Network for water environment preservation and restoration by the scheme of JICA-KOICA JOINT TRAINING PROGRUM for researchers and administrative person-in-charge.

Moreover, it is essential to create and update the Guideline on Measures against Lakes and Marshes for Japan, China and Korea.

Research Station/Model Region

Lakes Xihu and Taihu in China were selected as model lakes.

China side has targeted to collect the basic information of the two lakes and investigate the pollutant loads from the selected regions.

Japan side has developed and transferred the affordable Bio-Eco Engineering systems including advanced on-site domestic wastewater treatment Johkasou systems, ecoengineering using natural purification function of aquatic plants and soil treatments etc.

Korea side has analyzed how to use monitoring and modeling date for the countermeasures of the target basins.

Bio-Eco Engineering Research Laboratory in NIES, Japan was appointed as the core facility for the joint research station of the three countries, which was agreed by the TEMM.

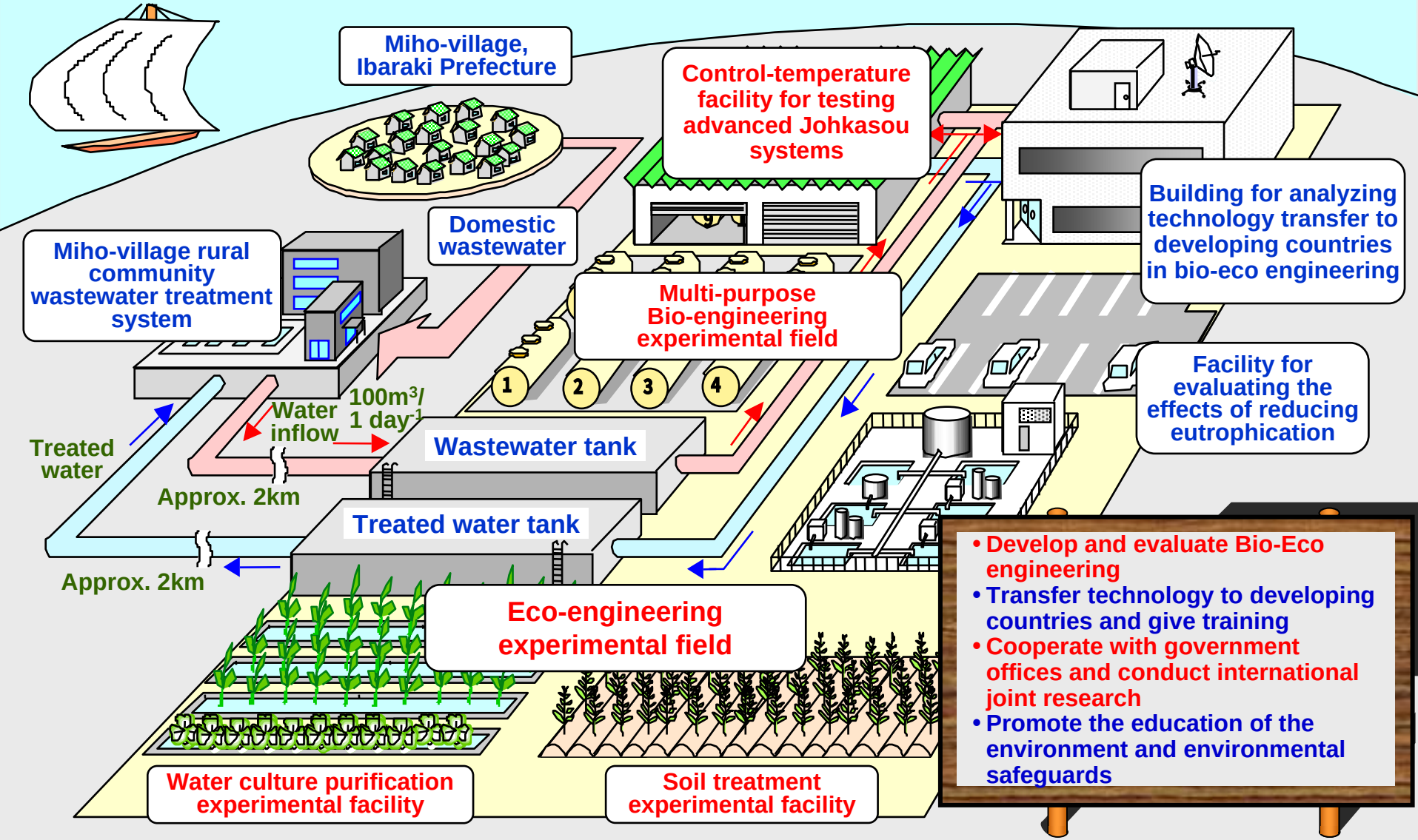
Lake Tai-hu

Toxic Algae

Toxin	LD_{50} ($\mu g \cdot kg^{-1}$)
Botulinus toxin	0.00003
Ciguatoxin	0.35
Tetrodoxin	8
Saxitoxin	10
Dioxin	20
Anatoxin-a(s)	40 - 50
Microcystin-LR	80
Microcystin-YR	100
Okadaic acid	200
Cholera toxin	250
Microcystin-RR	600
Potassium cyanide	5,000

* When administered intraabdominally to mice, The WHO guideline of microcystin LR for drinking water quality .

Lake Kasumigaura beside Bio-Eco E • R • Laboratory



Core Station for Promotion of Joint Research Projects between Japan, China and South Korea based on the International Bio-Eco Engineering Research Laboratory of National Institute for Environmental Studies

The Joint Research Organization

Besides NIES, CREAS and NIER of the three countries, Shanghai Jiaotong University, Tsinghua University, Southeast University, Department of Water Environment Erhai, Dali in China, Philippine University, AIT (Asian Institute of Technology) etc. were invited to participate in the joint research in order to promote the activities.

Moreover, the international core research project is promoted with the agreement of the environmental protection between Japan and China, and Japan and South Korea.

Research project	Counterpart
Research on development of suitable technologies to control greenhouse gas emissions during treatment of domestic wastewater using Bio-Eco Engineering system	Shanghai Jiao Tong University Hainan KONG
Research on the development of water and wastewater treatment processes applicable to China	CRAES Wei MENG, Yutian ZHANG
Research on advanced wastewater treatment processes applicable to China	Tsinghua University Yi QIAN
Research on advanced sewage treatment processes by soil system applicable to China	Institute of Applied Ecology Chinese Academy of Sciences. Tieheng SUN
Research on the development of water pollution control techniques for the TAIHU LAKE in China by Bio-Eco Engineering	CRAES Wei MENG, Yutian ZHANG
Development of eco-engineering technologies for the control of eutrophication in the Hongfeng Lake Basin in Guizhou, China	Guizhou Provincial Environmental Protection Bureau Kangming LI
Study on the monitoring of harmful algal bloom and effects of nitrogen and phosphorus	NIER Dong-Soo, Kong

Main Results and Achievements

Since the joint project started, following workshops have been held during last five years.

1st Workshop was held in NIES, Japan in 2001;

2nd Workshop was held in NIER, Korea in 2002;

3rd Workshop was held in Hangzhou Monitoring Center, China in 2003;

4th Workshop was held in NIES, Japan jointed with TPM Workshop in 2004;

5th Workshop was held in NIER, Korea in 2005.

In the 1st Workshop, Lake Xihu was appointed as the model lakes. Environmental information of Lake Xihu, technical information of Bio-Eco Engineering, and model simulation information were exchanged among the researchers from the three countries.

The roles of each side were clearly determined. During 2nd-4th Workshop, Lake Taihu was involved in the project. Based on three sides' roles, progressive results were achieved on the pollutant loads collection, Bio-Eco Engineering technological understanding and modeling simulation analyses.

TEMM GUIDELINE

In the 5th Workshop, the draft of "Guideline on the Management for Establishment of Eco-Sound Watershed Environment of Lakes and Marshes" was addressed, and the discussion and information exchange on this guideline were carried out among the researchers from the three countries.

The Guideline was edited by representative researchers. Prof. Yuhei Inamori (NIES, JAPAN) was appointed as the chief editor, and Profs. Xiangcan JIN (CRAES, China) and Jun-Dae Park (NIER, Korea) were vice editors. The guideline was completed at the end of December 2005 and will be published in each country, respectively.

Guideline on the Management for Establishment of Eco-Sound Watershed Environment of Lakes and Marshes

Chief editor : Yuhei Inamori (NIES, JAPAN)

Vice editor : Xiangcan JIN (CRAES, China)

: Jun-Dae Park (NIER, Korea)

As a person in charge of Bio-Eco Engineering Research Laboratory, NIES, I do hope to transfer and spread the energy saved, minimum maintenance, cost effectively, recycle oriented Bio-Eco systems to Asia-Pacific countries with the mutual cooperation with researchers from different countries.

NIES CRAES NIER

Action Plan for 2006 and Prospective

- To effectively introduce the Bio-Eco Engineering system to Lakes Xihu and Taihu as a measure technology for lake conservation and management and disperse to other Asian region.
- To collect the necessary environmental information of Lakes Taihu and Xihu simultaneously for developing the model analyses, and enact the training related to the technique of the model simulation in South Korea.
- To establish a network in Asian region based on the "Guideline on the Management for Establishment of Eco-Sound Watershed Environment of Lakes and Marshes" , and organic link with JICA-KOICA JOINT TRAINING PROGRAM.
- To establish the strategy for appropriate watershed management measures linked to the application development of lake preservation and management with 973,863 national projects of China.
- To hold 6th TEMM Workshop at Hangzhou Monitoring Center, China in August, 2006, and exchange the opinions and address the future prospective for practical direction creation of water environmental reproduction.

Long-range Transport of Atmospheric Pollutants and Aerosols in East Asia

Asian Environmental Research Group

National Institute for Environmental Studies

Research Objectives

- To better understand the current situation of atmospheric environment in East Asia and Northwestern Pacific regions
- To improve the atmospheric environment in this region by collaboration among East Asian countries

On-Going International Activities Participated

- EANET (Acid Deposition Monitoring Network in East Asia)

  13 East Asian Countries

- LTP (Long-range Transboundary Air Pollutants in Northeast Asia)

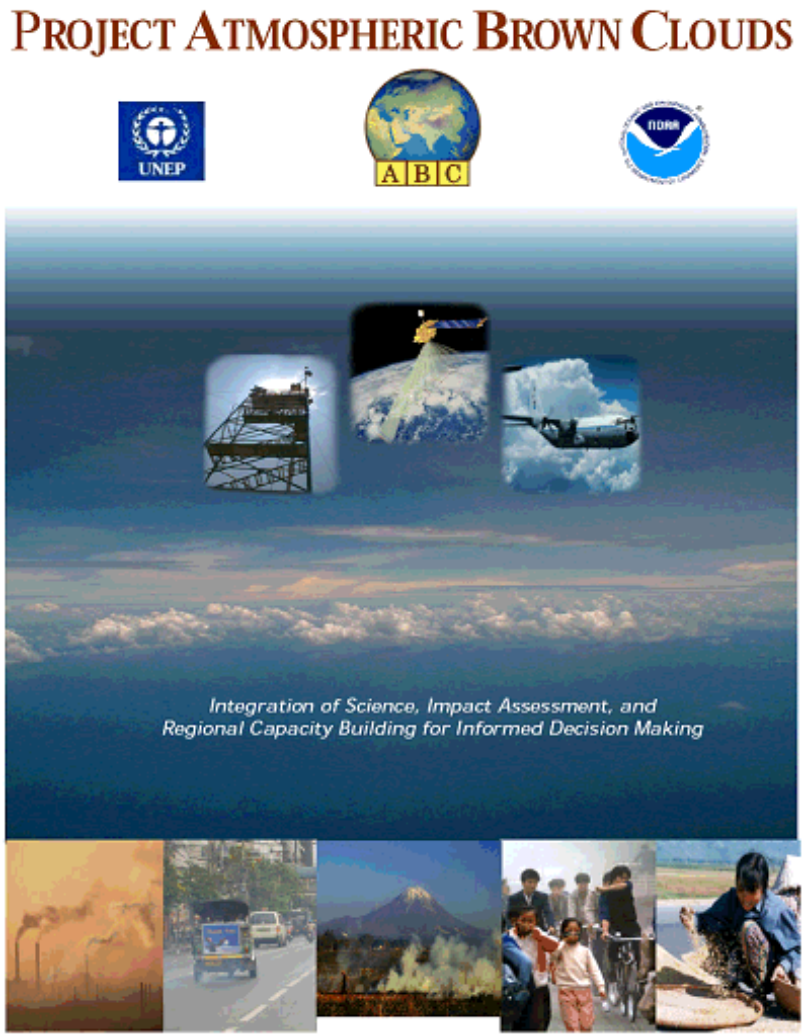
  Korea (MOE, NIER), Japan (MOE, ADORC, NIES)

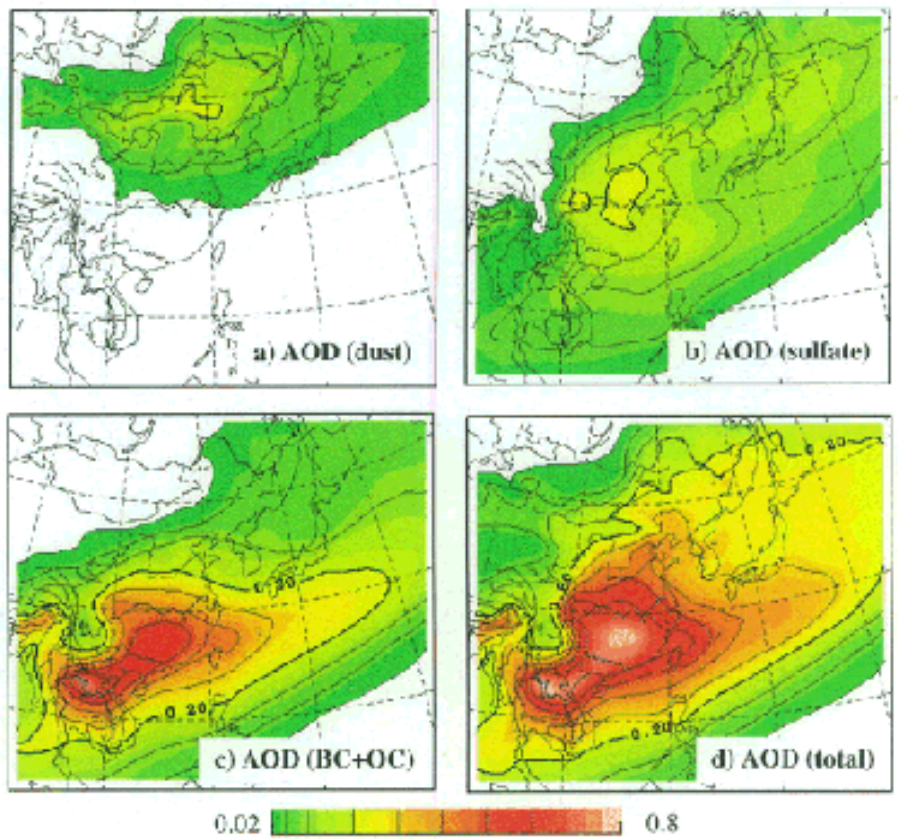
  China (SEPA, CRAES)

- ABC (Atmospheric Brown Clouds – Asia)

  UNEP

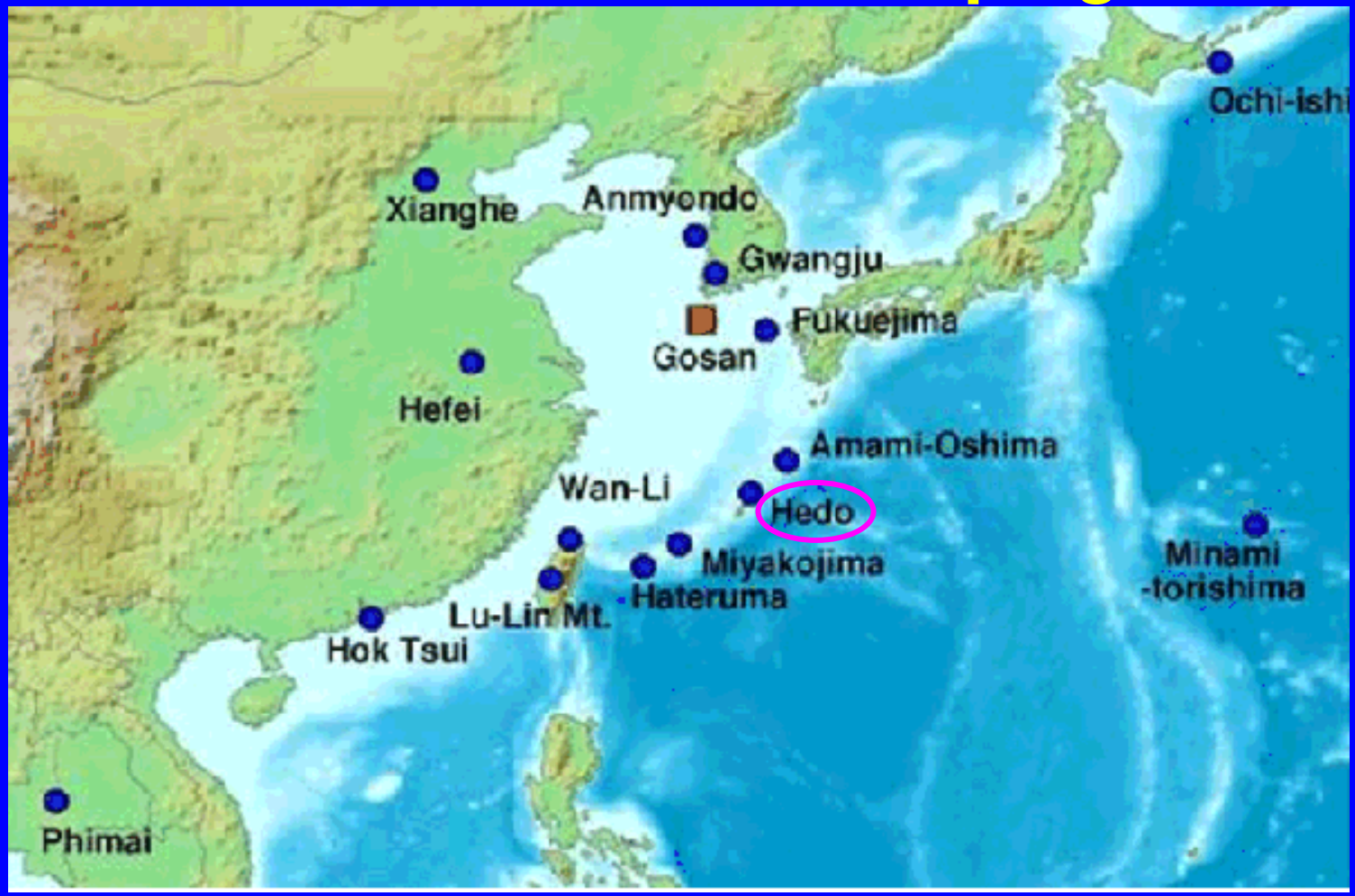
ABC(Atmospheric Brown Clouds, Asia)





ABC Super Sites and Japanese Super Site

Observation sites participated in **ABC-EAREX 2005 Campaign.**



Hedo was one of important observation sites.

Cape Hedo, Okinawa

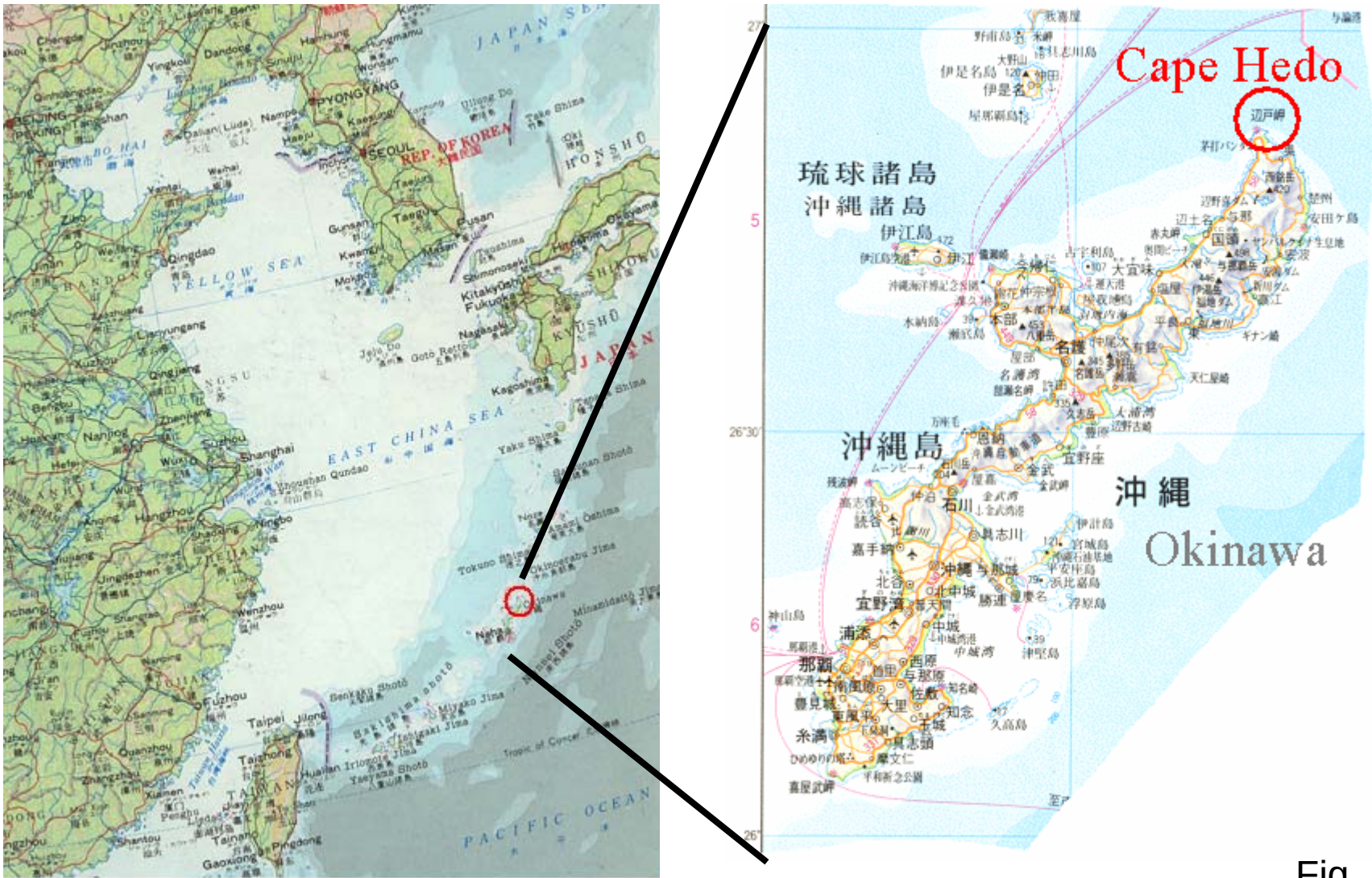
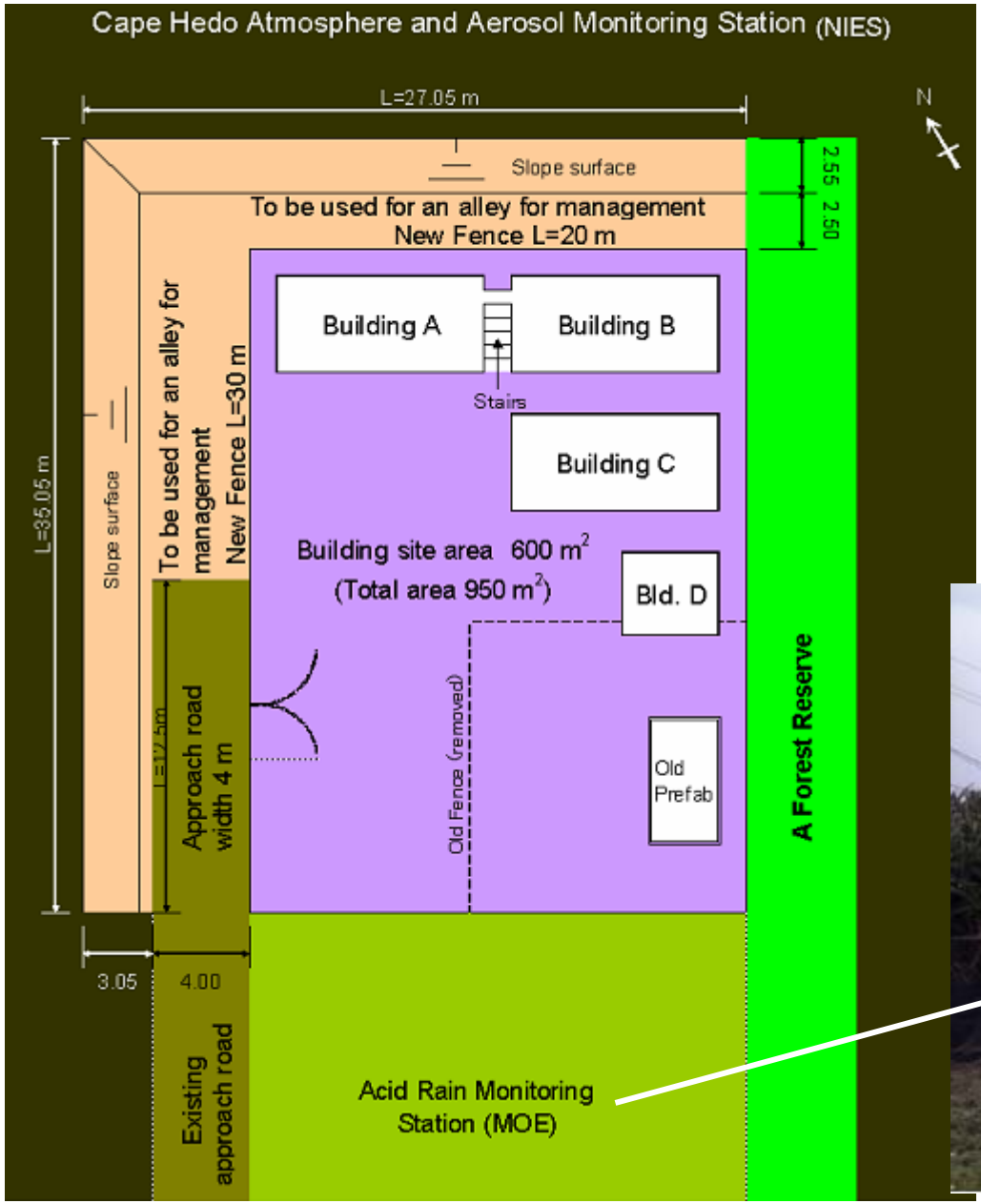


Fig. 1


Cape Hedo Atmosphere and Aerosol Monitoring Station (NIES)
L=27.05 m
N
Slope surface
2.55
2.50
To be used for an alley for management
New Fence L=20 m
Building A
Building B
Stairs
Building C
To be used for an alley for management
New Fence L=30 m
L=35.05 m
Slope surface
Building site area 600 m2
(Total area 950 m2)
Bld. D
Approach road
width 4 m
Old Fence (removed)
Old
Prefab
A Forest Reserve
3.05
4.00
Existing
approach road
Acid Rain Monitoring
Station (MOE)

Aerosol Mass Spectrometer
（AMS)

TEOM and EC/OC Monitor

Instruments for radiation monitoring

Instruments to be operated at Cape Hedo Super Site (1)

Location	Cape Hedo, Okinawa
Latitude	26.87 ° N
Longitude	128.26 ° E
Aerosols	**Aerosols**
Optical thickness Angstrom coefficient	Sky radiometer PREDE POM-01 (RIHN)
	i-sky radiometer POM-02 (RIHN)
Vertical distribution	Lidar (NIES)
Scattering coefficient	Nephelometer TSI MODEL3563 (RIHN)
	Nephelometer M903 (RIHN)
Absorption coefficient	Aethalometer Magee AE-31 (RIHN)
	PSAP(Only for IFE) (CERES)
Particle number	OPC Met One Model 237 (now under re-calib.) (CERES)
	OPC Royco LAS 236 (Only for IFE) (CERES)
Particle mass concentration	TEOM R&P (NIES)
Aerosol chemical components	AMS AERODYNE (NIES)
	Nitrate monitor R&P (NIES)
	Hi-Vol filter sampling (Organics:NIES; Elements:Tokyo Metr. U)
	PM10, PM2.5 Filter sampling (NIES)
	Low-Vol Filter sampling (Ionic species:Ryukyu U)
Black carbon	EC/OC monitor R&P (NIES)
	BC monitor Thermo MAAP5012 (RIHN)

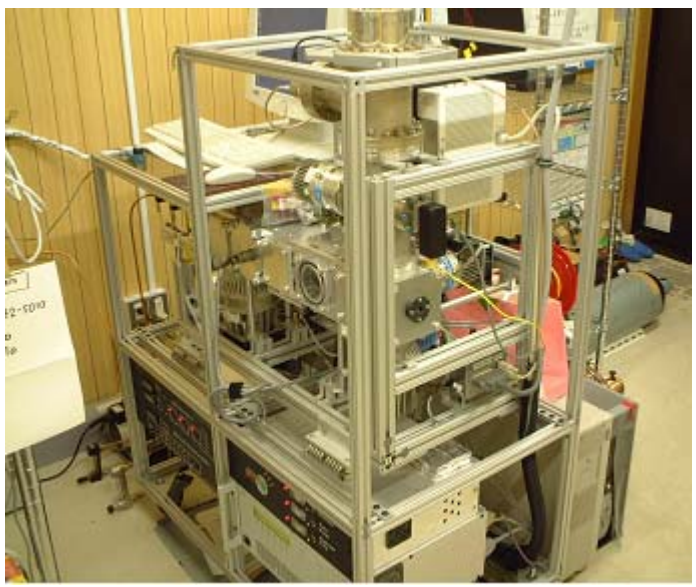
Instruments to be operated at Cape Hedo Super Site (2)

Clouds	**Clouds**
Optical thickness	i-Sky radiometer (CERES)
Cloud amount	Skyview PSV-100 (CERES)
Water content	Microwave radiometer WVR-1100 (CERES)
Cloud height Dist.	Radar FM-CW 94GHz(Available only for IFE) (CERES)
Radiation	**Radiation**
	Pyrheliometer CH-01 (CERES)
	Pyranometer CM21 (CERES)
	Pyrgeometer PIR (CERES)
Gas	**Gas**
Ozone	Ozone monitor (NIES, Tokyo Metr. U)
SO_2	SO_2 monitor (MOE)
NOy	NOy monitor (Osaka Pref. U.)
HC	HC monitor (Meijo U)
CO	CO monitor (Tokyo Metr. U.)
HNO_3(g)	Gaseous HNO_3 monitor (Osaka Pref. U.)
Weather	**Weather**
Rain	Rain sampler (MOE)
Temp., Humidity, Press., Rain, Wind	Weather Trasmitter VISALA (NIES)
Temp. Humidity, Wind	Weather Monitors (MOE)
	Ultrasonic Anemometer GILL (RIHN)
Temp., Humidity, Press., Wind	Temperature/RH sensor VISALA (RIHN)
	Temperature/RH/Pressure sensor MET3 (CERES)

Measurements of EC/OC and Aerosol Chemical Compositions at Cape Hedo

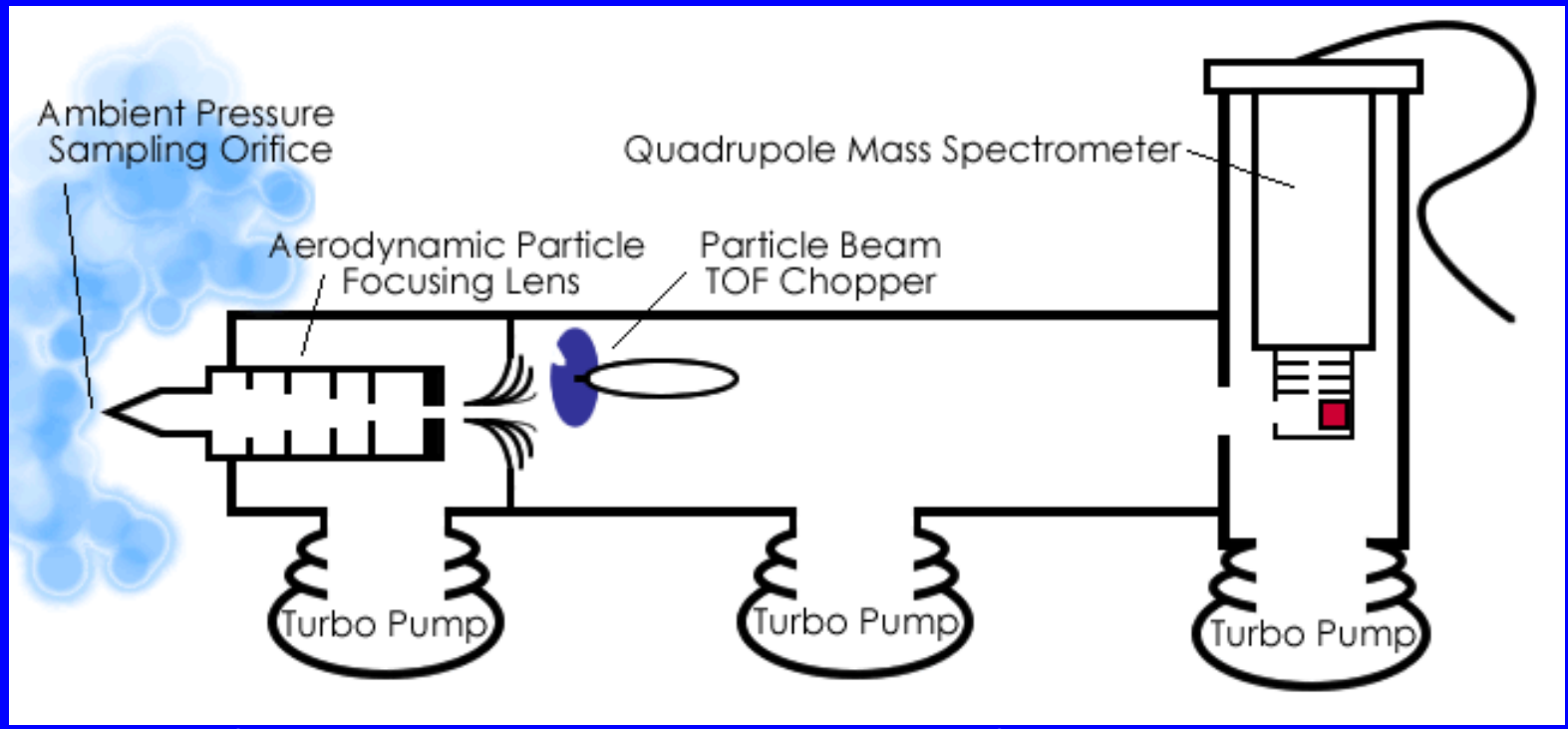
Instruments employed

Carbon Monitor (R&P5400)
with PM2.5 cyclone；
OC：340℃
TC：750℃
EC=TC-OC



Aerosol Mass Spectrometer (Aerodyne Inc., AMS)；
Both size distribution and chemical composition are analyzed simultaneously.

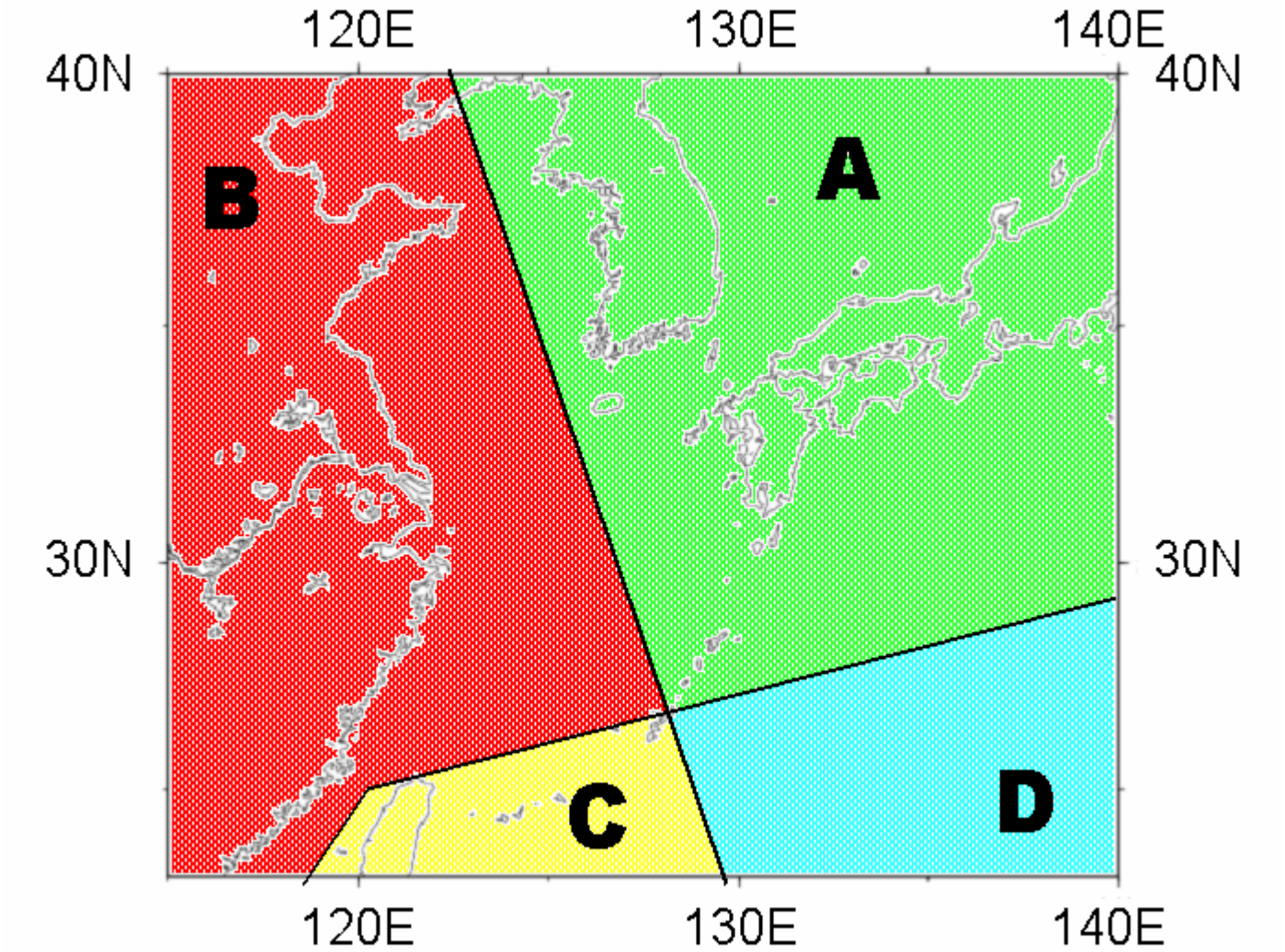
Aerosol Mass Spectrometer (AMS)



Credit for animation: Matt Thyson (Massachusetts) & Prof. Jose-Luis Jimenez (U Colorado)

- particle separation: Aerodynamic lens under high vacuum
- particle size distribution: Time of flight (TOF: 3 – 4 ms; size range:0.1 – 1.5 μm)
- chemical components: flash vaporization (~600 °C) and electron impact ionization – Q-pole mass spectrometer (0-300 amu)

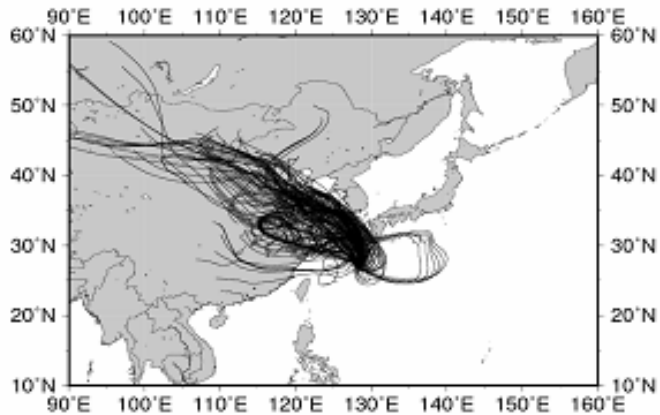
Classification of air mass origin



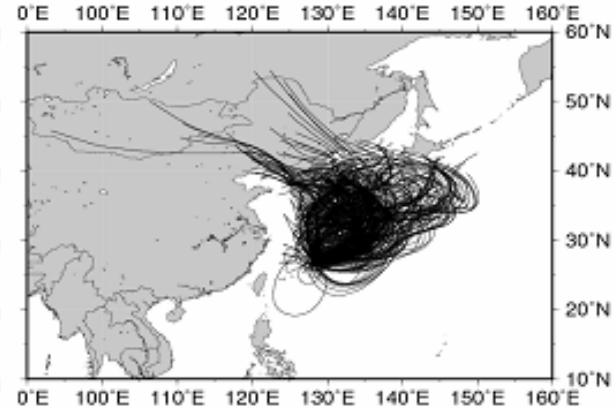
A: Korea &Japan, B: China, C: SE Asia, D: PacificOcean

Back trajectory calculations and classification of trajectories

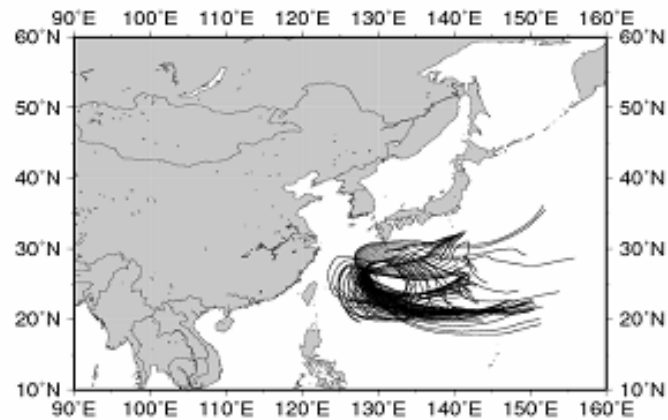
China Origin(04.3~05.1.)



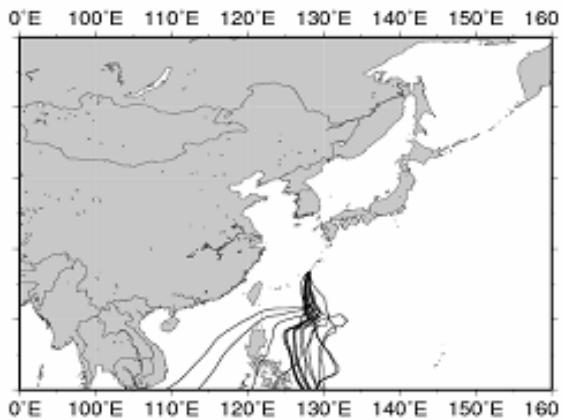
Jpn&Kor Origin(04.3~05.01.)



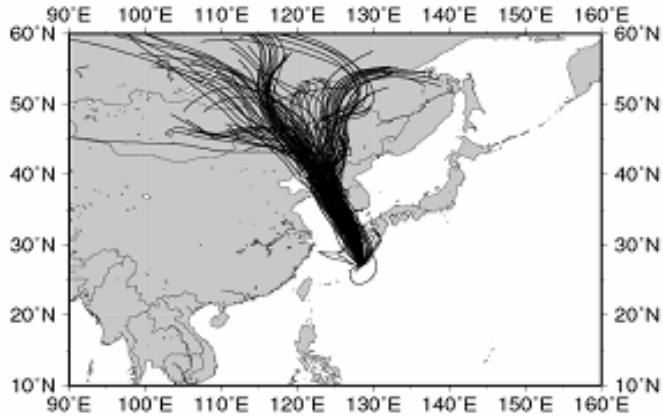
P.Ocean Origin(2004.5~6.)



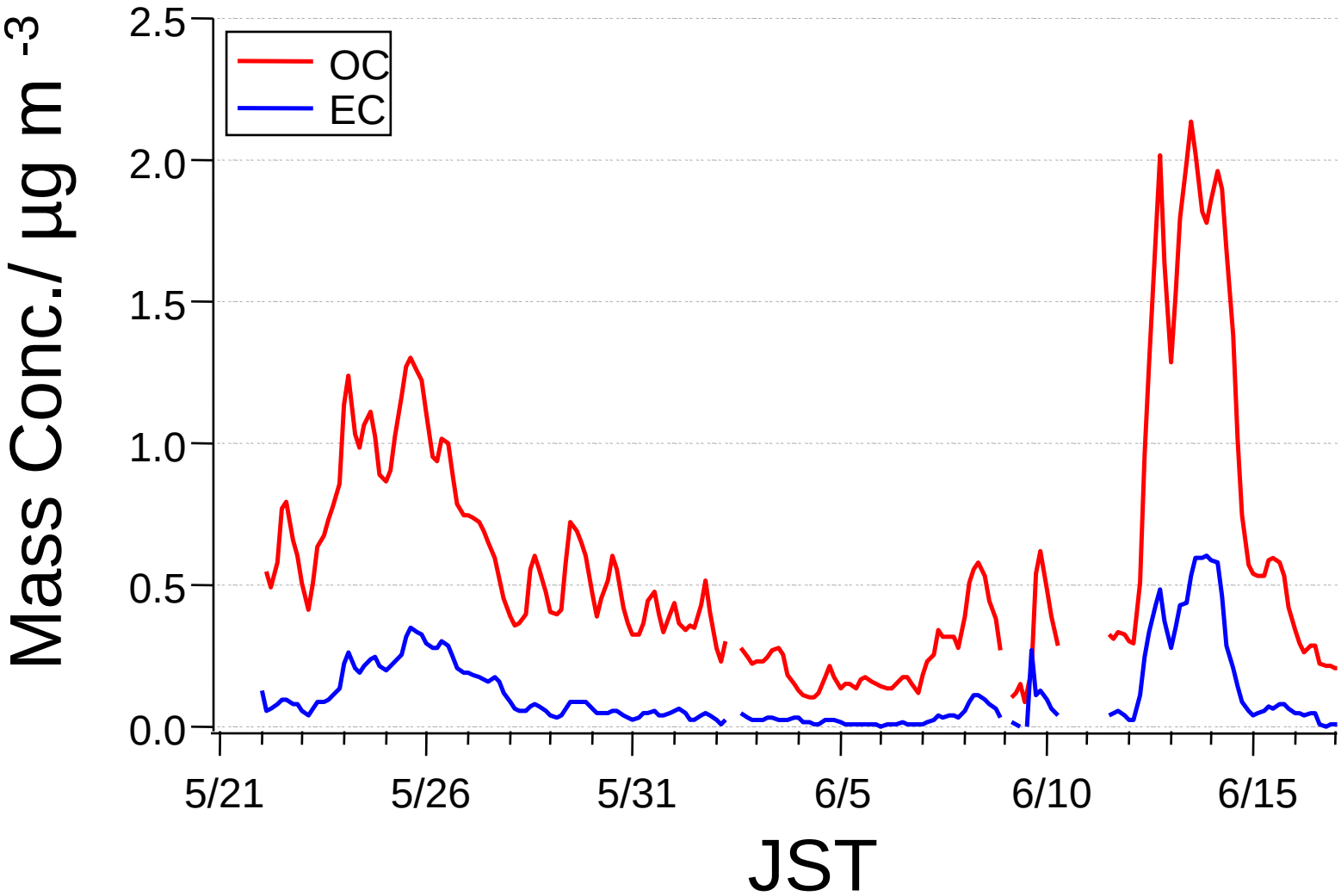
SE-Asia Origin(2004.5~6.)



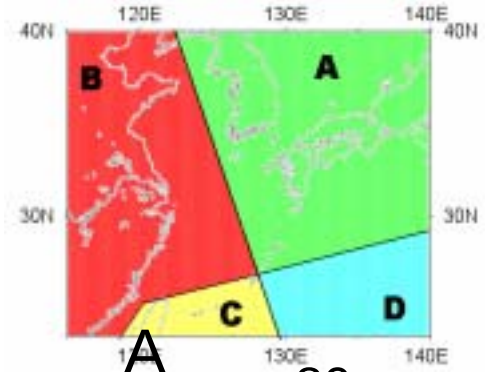
NE China Origin(04.12~05.1.)

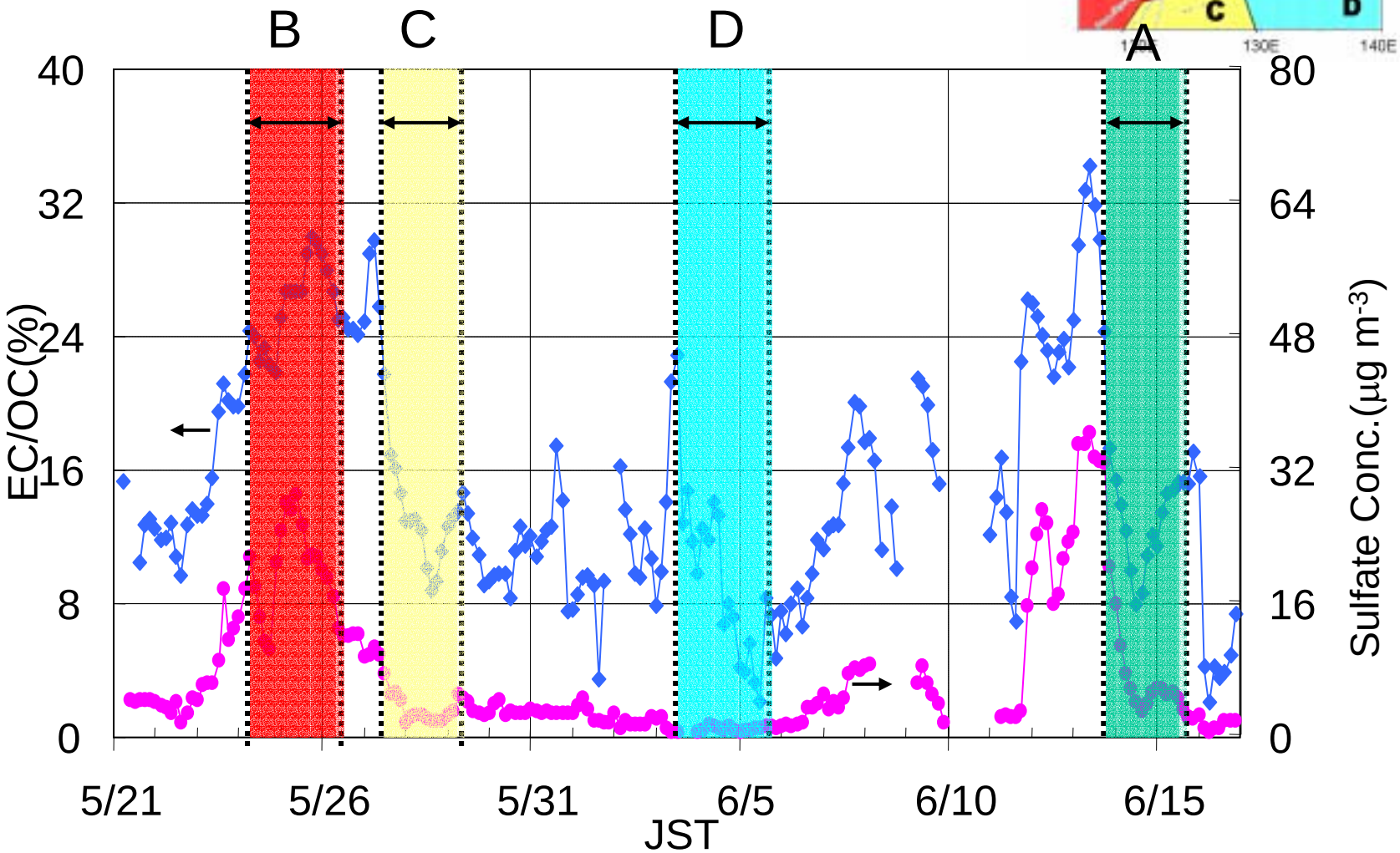


May-June, 2004



EC/OC ratio and Sulfate Conc. (May-June)





Concentration of Each Component Classified by the Area of Origin (May-June)

Origin	Sulfate ($\mu g/m^3$)	OC ($\mu g/m^3$)	EC ($\mu g/m^3$)	EC/ OC (%)	σ (EC/ OC)
China	**19.82**	**1.09**	**0.26**	**23.68**	2.37
Kor & Jpn	5.94	**0.69**	**0.10**	**13.79**	3.56
P. Ocean	1.46	0.18	0.01	6.95	2.58
SE Asia	2.57	**0.54**	**0.07**	**12.09**	1.67

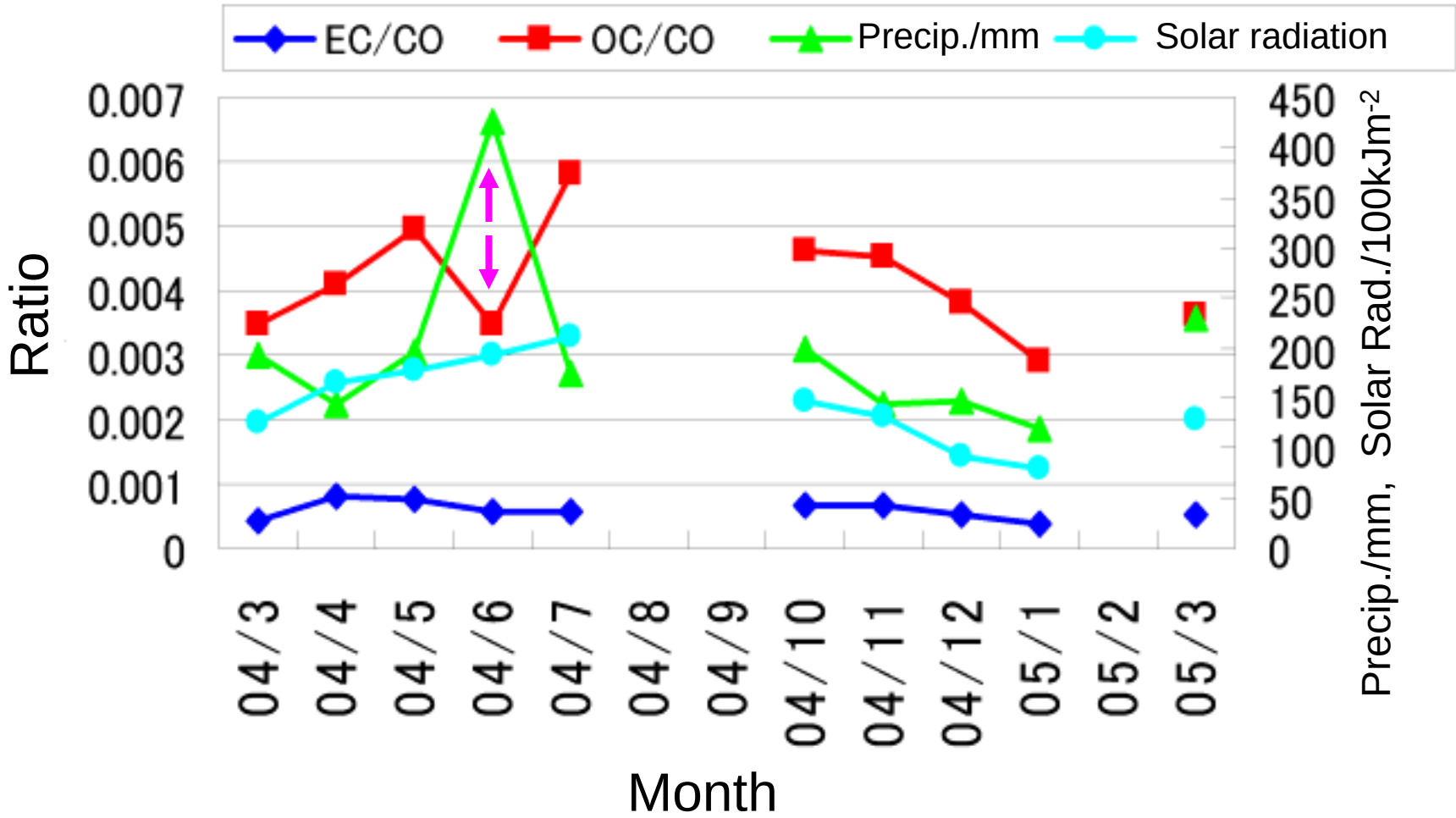
EC/OC ratio：
China 20-30 %, Kor&Jpn 10-20 %
SE Asia;10-20 %, P. Ocean <10%

Comparison of EC/OC with the Data of China

site	Spring (Obs. %)	Annual (Esti-mate %)	Annual (Obs. %)	Annual (Obs. %)
Okinawa	29.5 (Mar., Apr)	(←Assumed to originate in China by back trajectory analyses.)		
China	32.7 (Shanghai)	30.8 (Whole China)	40.4 (Beijing)	43.3 (Shanghai)

Whole China: D.G. Streets et al.(2003)
Shanghai: B. Ye et al.(2003)
Beijing: K. He et al.(2001)

Monthly variation of EC/CO and OC/CO ratios



OC/CO ratio is high in summer and low in winter, indicating that OC is a photo-chemical-reaction product. The low OC/CO ratio in June was due to heavy precipitation.

Table 1: Yearly mean concentrations of sulfate (SO_4), OC and EC and the ratio of EC/OC.

Origin	SO_4	OC	EC	EC/OC
China	16.4	1.22	0.28	0.21
Jpn&Kor	8.29	0.64	0.10	0.15
SE Asia	3.70	0.55	0.07	0.12
P.Ocean	2.19	0.43	0.04	0.08

(SO_4: $\mu g m^{-3}$, OC and EC: $\mu g C\ m^{-3}$)

Summary

1. EC/OC ratio was high in the air mass of China origin.
2. EC showed better correlation with sulfate suggesting that emission from coal combustion is still high in China.
3. Organics transported to Okinawa were photo-chemically produced and extensively oxidized.
4. OC was high in warm seasons, but it can be removed by precipitation. That means water-soluble components are contained in OC.

Plans for this year and the future

- Intensive observation campaign (April 2006):
  - Aerial observations:

    around Beijing (C and J) and over the Yellow Sea (K)
  - Ground based observations:

    Beijing (C and J), Qingdao and Dalian (C), Gosan and Anmyon (K), Fukue and Hedo (J)
- Measurements of chemical composition of aerosols through year
- International collaborative campaign

Joint Communique

The Third Tripartite Presidents Meeting among

NIER, CRAES and NIES

Joint Communique

At the invitation of President YOON Seong-Kyu of the National Institute of Environmental Research (NIER) of Korea, President MENG Wei of the Chinese Research Academy of Environmental Sciences (CRAES) of China and President OHTSUKA Ryutaro of the National Institute for Environmental Studies (NIES) of Japan visited Jeju, Korea to attend the Third Tripartite Presidents Meeting (TPM) on May 16-17th, 2006.

The meeting was preceded on May 16th by an international workshop on “Air Quality Management in Northeast Asian Countries,” a topic identified at the working level meeting for the Third TPM in September 2005 as a priority environmental issue.

At the opening of the Third TPM, President Yoon expressed his appreciation for CRAES’ initiative in hosting the First TPM in Beijing, February 2004. The

partnership to improve the environmental quality of Northeast Asia through research cooperation was confirmed at the Second TPM in Tsukuba, October 2004, and strengthened at the Third TPM.

The presidents further observed that the working level meeting held in September 2005 in Korea was conducive to the success of the Third TPM and agreed that the practice should be continued to assist the Fourth TPM in implementing joint projects.

The presidents exchanged information on the recent reforms taken place in their institutes to meet the challenge of changes in environmental values. They recognized the new paradigm of reorganization at NIER which aims to encourage holistic solutions to environmental problems. The presidents also expressed special interest in the Second 5-year plan of NIES and the Eleventh 5-year plan of CRAES.

On the topic of information exchange, the presidents agreed to assign the officials in charge of international cooperation at each institute as focal points for exchanging information. English language copies of annual reports, and the lists and the gist of major research projects will be deposited in the institutes' libraries to facilitate

research cooperation. In addition, the presidents agreed to post the progress of TPMs on each institute's website for public awareness.

Recalling the six joint research projects agreed in the Second TPM, on 'freshwater pollution,' 'air pollution including vehicular sources,' 'transboundary air pollution,' 'yellow sand storm,' 'hazardous materials contamination such as endocrine disrupting chemicals and POPs,' and 'migratory birds and wetlands,' the presidents agreed that the implementing scheme of cooperative research will be jointly developed by the responsible focal points. The draft report of the consultation, including financial plans, will be submitted and reviewed at the next working level meeting in the form of cooperative research proposals to be considered at the Fourth TPM.

The presidents further agreed to welcome representatives of kindred research institutes in the three countries as observers in future TPMs. Lists of such candidate research institutes will be submitted to the next working level meeting. It is recommended, however, that the observers bear their costs of participation. In addition, the Fourth TPM should seek to incorporate kindred research institutes of other countries in Northeast Asia: North Korea, Mongolia and Russia. The presidents

of NIER and NIES applauded efforts of CRAES to engage a North Korean environmental research institute as a TPM observer.

The presidents reviewed the outputs of the Seventh Tripartite Environment Ministers Meeting (TEMM) held on October 22-23, 2005, at which the Ministers expressed support for the Third TPM. The presidents also expressed gratification at the fruitful result of the 1st phase “Freshwater Pollution Prevention Project” that was carried out as one of the TEMM projects with the participation of NIER, CRAES and NIES. The presidents also acknowledged that the “Long-range Transboundary Air Pollutants in Northeast Asia (LTP)” project contributes to the improvement of transboundary pollution problems in Northeast Asia and that the 8th Expert Meeting for LTP held in November 2005 in Jeju was successful.

The presidents further recognized severe episodes of yellow sand storm in spring 2006. In response, they agreed to give full support for a joint project among the three institutes of “yellow sand storm.” The meeting to develop the project will be planned by CRAES in the autumn of 2006.

The presidents reaffirmed that the three institutes should continue the joint efforts to strengthen the existing and evolving cooperation among them, and agreed to continue the annual TPM as a vehicle for regular communications. President MENG of CRAES offered to host the Fourth TPM in China in the spring of 2007, including a workshop whose theme will be decided at the Working Level Meeting in China in February 2007.

Finally, the presidents expressed their deep satisfaction with the outcomes of the meeting. Presidents MENG Wei of CRAES and OHTSUKA Ryutaro of NIES thanked President YOON Seong-Kyu of NIER for his vision and hospitality.

YOON Seong-Kyu

President, National Institute of Environmental Research, Korea

MENG Wei

President, Chinese Research Academy of Environmental Sciences, China

大塚 柳太郎

OHTSUKA Ryutaro

President, National Institute for Environmental Studies, Japan

May 17, 2006 in Jeju, Korea

APPENDICES

1. Program and Agenda of TPM3
2. Opening address and Closing address of the 2nd International Workshop
3. Participants List

APPENDICES

The 3rd TRIPARTITE PRESIDENTS MEETING

May 15-19, 2006
Seogwipo KAL Hotel, Jeju, Republic of Korea

Program

May 15, 2006

16:00	Registration

May 16, 2006

09: 30	Preliminary Working Level Meeting
11:30	Meet the presidents (Lobby Coffee Shop)
12:00	Lunch (Diamond Hall)
13:00	**International Workshop on Air Quality Management in Northeast Asian Countries (Rose Room)**
13:00	Workshop registration
13:30	Opening
	Opening Address by NIER president Yoon Seong-Kyu
	Preliminary Working Level Meeting (continued)
17:00	Closing Address by CRAES president Meng, Wei
	Closing Address by NIES president Ohtsuka, Ryutaro

18:30 Welcome dinner hosted by NIER President Yoon, Seong-Kyu (Diamond Hall)

May 17, 2006 **3rd Tripartite Presidents Meeting (Crystal Room)**

9:00 Opening of the Meeting (TPM3)

9:05 Opening Address by NIER

President Yoon, Seong-Kyu

9:20 Keynote Speech by CRAES

President Meng, Wei

9:35 Keynote Speech by NIES

President Ohtsuka, Ryutaro

9:50 Tea Break

10:00 **Session 1: Presentations**

- Introduction to the Recent Reforms of NIER

Dr. Lee, Jong Chun (NIER)

- Introduction to the Next 11th 5-Year Plan

Dr. Wang, Yeyao (CRAES)

- The Second Five-Year (2006-2010) of the National Institute for Environmental Studies

Mr. Iijima, Takashi (NIES)

11:00 Tea Break

11:10 **Session 2: Presentations (Research Activities)**

- Research Activities on Sound Management of Chemicals in NIER

Dr. Choi, Kyunghee (NIER)

- Vehicle Emission Pollution in China and Key Issues for Sustainable Development

Dr. Bao, Xiaofeng (CRAES)

- Asian Environmental Research Projects in NIES

Dr. Nakane, Hideaki (NIES)

12:00 Official Photography

12:10 Lunch (Main Restaurant)

13:30 **Session 3: Discussion**

- Review of TPM 1 and TPM 2

Dr. Kim, Myungjin

- Designation of Focal Points for Information Exchange
- Review of Ongoing Joint Researchers
- Designation of Focal Points for Proposed Joint Projects
- Future Cooperation Including Development of Expert Exchange Program
- Others

17:00 Conclusion

17:00-18:00 Adjourn of the meeting for the finalizing of the Joint Communiqué

18:00 Signing Ceremony of Joint communiqué

18:30 Dinner hosted by NIES

May 18, 2006

09:00 Departure for Study tour

09:40 Visit to Gosan Meteorological Monitoring Site

11:00	O’sulloc green tea museum
12:00	Lunch hosted by CRAES
14:00	Visit Sanjicheon (Ecologically restored river), Jeju
16:00	Eco-tour
18:30	Dinner

May 19, 2006

09:00	Check out

Opening address of the 2nd International Workshop

YOON Seong-Kyu

President of NIER, Korea

Professor MENG Wei, President of the Chinese Research Academy of Environmental Sciences(CRAES), Dr. Ohtsuka Ryutaro, President of the Japanese National Institute for Environmental Studies(NIES) and distinguished participants, ladies and gentlemen.

It's my great honor and pleasure to welcome you to Jeju, the Island of World Peace, and give the opening address for this joint workshop commemorating the third Tripartite Presidents Meeting among CRAES, NIES and NIER.

This joint workshop was suggested and encouraged in the 2nd Tripartite Presidents Meeting. The title of our workshop is "Air Quality Management in Northeast Asian Countries." This is obviously an important environmental issue in Northeast Asia and also related to one of the six TPM joint research projects.

Through rapid industrialization, Northeast Asia has become one of the most dynamic economic belts in the world. Unfortunately along with this advancement, air pollution in the mega-cities and long-range transboundary air pollutants are becoming hot

issues in this area. So, NIER, CRAES and NIES have cooperated closely in joint research projects like the LTP project and EANET.

In this workshop, the three countries will introduce the result of their research for air quality management in our mega-cities. CRAES will suggest the improvement of air quality in Beijing for hosting the 2008 Beijing Olympics.

NIES will give a presentation about research tools for air quality management. NIER will show technical efforts for air quality improvement in the Seoul metropolitan area and air pollution reduction strategies for Seoul.

I'm sure that this workshop was conceived to share our experiences to improve air quality in Northeast Asian Countries. And, I hope that this workshop will provide an impetus for continuing cooperative research between our three countries and the basis for improving air quality management in Northeast Asia.

Finally, I would like to extend my sincere appreciation to the delegations of the three countries for their participation and to the organizing staffs for their hard work in the preparation of this workshop.

Thank you.

Closing address of the 2nd International Workshop

OHTSUKA Ryutaro

President, NIES, Japan

First of all, I would like to say congratulations for success of this workshop, thanks to a nice selection of the topic and excellent contribution of all speakers. All members of NIES, including myself, really enjoyed the presentations and discussions.

I was particularly pressed by many well-designed research activities conducted by colleagues of NIER and CRAES, who have tackled serious problems, to which each country has faced, in cooperation with national and local governments. For Korea, research activities for contributing to environmental policy against atmospheric pollutions in Greater Seoul are very excellent. For China, I have understood effective policy makings against atmospheric pollution with different strategies for three zones in the country as a whole and various efforts to make clean atmosphere in Beijing area until 2008, when Olympic Games will be held.

Commonly observed change in atmospheric environment in any cities are decreases in CO and SO2 but increases in NO2 and O3, demonstrating clearly what we should pay special attention. In relation to this point, two Japanese speakers emphasized significance of our collaboration. In particular, Dr. OHARA pointed out an important role of scenario makings for inventory analysis, and Dr. SUGIMOTO proposed observations of yellow sand storm (Asian dust), using lidars, at many sites

in three countries and some adjacent countries like Mongolia.

I believe these research activities should progress more concretely in near future with collaboration of the researchers of CRAES, NIER and NIES. Finally I thank again all contributors and organizers of this workshop.

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■ Cover : Statue of a Jeju local woman with Heobeok (drinking water carrier used in Jeju) on her back. It had been a daily routine and duty for women in Jeju to draw water from the freshwater springs near the shoreline until the first drill reached the groundwater in the early 70's. The porous basaltic base rock is now the source of high quality mineral water enjoyed not only in Jeju but also in the mainland Korea.