

Proceeding 1st International Symposium of the Kanazawa University 21st-century COE Program

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Proceedings

1st International Symposium of the Kanazawa University 21st-century COE Program

Environmental Monitoring and Prediction of Long- and Short-Term Dynamics of Pan-Japan Sea Area
Construction of Monitoring Network and Assessment of Human Effects

17-18 March 2003, Kanazawa, Japan
Kanazawa Citymonde Hotel

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Symposium Secretariat

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Proceedings: International Symposium of the Kanazawa University 21st-Century COE Program Volume 1
Edited by Naoto KAMATA

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Message from the Project Leader

About 21st-Century COE Program Sponsored by MEXT

In the COE (Center of Excellence) Program which gives concentrated support for research groups, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) will give grants to researchers in specialized fields of high potential which are necessary for forming a research base of world class standards. Last year in 5 fields (with a budget of 18,200,000,000yen) out of the target 10 fields, there were 464 applications from 163 public and private universities out of which 113 applications from 50 universities were selected. From Kanazawa University, research titled "Environmental Monitoring and Prediction of Long- and Short-Term Dynamics of Pan-Japan Sea Area: Construction of Monitoring Network and Assessment of Human Effects" was selected for this base program in the "Interdisciplinary, Complex, Groundbreaking" field.



About The Project of Kanazawa University 21st-century COE Program

Title: Long- and Short-Term Dynamics of Pan-Japan Sea Area: Environmental Monitoring and Prediction

Project Leader: Kazuichi Hayakawa

Project Members: Professor Shoji ARAI; Professor Michio KATO; Professor Kazue TAZAKI; Professor Chikayoshi YATOMI; Associate Professor Takahiro KAMIYA; Associate Professor Takuya KAWANISHI; Associate Professor Ryoichi KIZU; Associate Professor Tsutomu SATO; Associate Professor Shinji TSUKAWAKI; Professor Takashi IBUSUKI; Professor Kenji KASHIWAYA; Professor Chikao KANAOKA; Professor Kazuhisa KOMURA; Professor Yuichi SASAYAMA; Professor Koji NAKAMURA; Professor Masayuki MIKAGE; Associate Professor Naoto KAMATA; Professor Shigeo KIMURA; Associate Professor Masayoshi YAMAMOTO.

Project Summary: The Sea of Japan is a marginal sea surrounded by the Japanese Islands, Korean Peninsula and Eurasian Continent, and it is rich in natural resources such as aquatic resources. However, this area is a zone of frequent earthquake and volcanic activity, because the Sea of Japan is located between the continent and an ocean trench. Moreover, the Japan Sea is vulnerable to tanker accidents, chemical factory effluents and radioactive contamination etc., because it is closed with narrow channels at both ends. In the meantime, Japan and the countries that are located on the opposite shore of the Japan Sea (Russia, China, Korea and North Korea) have large populations and are rapidly developing their industries and economies with remarkable innovations.

The activities of these countries require the consumption of large amounts of fossil fuel, and result in the release of carbon dioxide, acidic products and combustion particulates. These pollutants, when combined with the natural materials such as yellow sands, etc., can have a large effect on the environment at global scale. Therefore, the Pan-Japan Sea is one of the most attractive areas for environmental scientists in the world, because it is good place to do researches. To prevent the disaster and to ensure that the Pan-Japan Sea area remains prosperous and safe, prediction of long- and short-term fluctuation in the environment and development and maintenance and accident prevention countermeasures based on the prediction are very important.

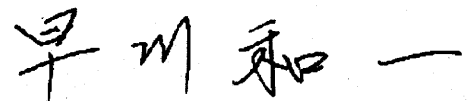
In this program, the Division of Global Environmental Science and Engineering, Graduate School of Natural Science and Technology, Kanazawa University is positioned as a center of excellence (COE) in Japan for the above research and education with foreign universities and research institutes. The goals of the research and education on the development of highly sensitive environmental monitoring methods for the Pan-Japan Sea area are to construct data information networks, to predict environmental variations based on the monitoring, to maintain useful resources and to use them efficiently, and to prevent accidents that could damage the environment.

Past research results: Following is a list of the major research results on the environment in the Pan-Japan Sea area made in our group COE.

- 1) **Oil spills:** Soon after a heavy oil spill in the Sea of Japan in 1998, research on the environmental damage and recovery started. Although many researchers went on to other projects once the situation was settled, the researches of this COE with researchers in China, Russia, and Korea are continued, and resulting in the discoveries of endocrine disrupting action and bacterial degradation of heavy oil.
- 2) **Acid rain & snow:** We showed that sulfur dioxide from the Asia continent was the cause of acid rain and snow which was specifically observed in the Sea of Japan side in winter and the mechanism was clarified. In addition, an effective technology for controlling sulfur dioxide pollution was proposed. And, we promoted an international study for the development of a remote sensing technique that measures forest activity and its application.
- 3) **Polycyclic aromatic hydrocarbon and nitropolycyclic aromatic hydrocarbon:** These carcinogenic/endocrine disrupting compounds are formed through the combustion of coal and petroleum, etc., and exist in suspended particulate matter in the atmosphere. An ultrasensitive method for the analysis of these pollutants has been developed and the pollution in the Pan-Japan Sea area countries by these compounds has been clarified. In addition, technology for the collection of separate type of particulates has been developed.
- 4) **Environmental effect of radioactivity:** This COE has radioactivity measurement facilities whose sensitivity is the highest in the world. As specific examples of the applied researches, we have reevaluated the scales of the atomic bombs of Hiroshima and Nagasaki, and have evaluated the radioactive damage of the JCO accident.
- 5) **Geological and environmental history:** Collections of organisms and sediments have clarified the climatic variation and global environmental change history in the Pan-Japan Sea area. In addition, the geological fluctuation history in Asia region which surrounds the Sea of Japan has been clarified and the theory of the fracture mechanics of rock mass has been established.
- 6) **Climatic change, forest decline, and medicinal plant resources change:** We are finding that there may be a causal relation between the death of oak trees on the Sea of Japan side of Japan and global warming, and we are examining the effects of environment factors on the chemical composition of medicinal plant.

International Symposium: This project should be dealt with from a long-term view and cooperation with many researchers in not only Japan but also in the world is necessary. It is my great pleasure to hold the 1st International Symposium of the Kanazawa University 21st-century COE Program "Environmental Monitoring and Prediction of Long- and Short-Term Dynamics of Pan-Japan Sea Area: Construction of Monitoring Network and Assessment of Human Effects" during March 17-18, 2003, in Kanazawa, Japan. The purpose of this symposium is to bring together the researchers from all countries who study the environment in the Pan-Japan Sea area to increase the level of communication and to promote cooperation on research and education networks.

This symposium will consist of a joint meeting of all participants on the first day, followed by five regional conferences on the second day. The five regional conferences will be devoted to Crustal and Paleo-oceanographic change, Limno-climatic Change, Atmospheric Environment (including Environmental Radioactivity), Ecosystem and Biodiversity and Water and Soil Environments, are held on the second date. We expect the symposium to become fruitful by active discussions.



Kazuichi HAYAKAWA
Professor

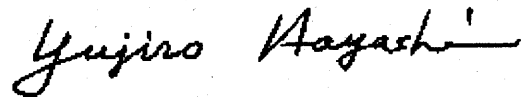
Graduate School of Natural Science and Technology
Kanazawa University

Welcome Speech From President of Kanazawa University

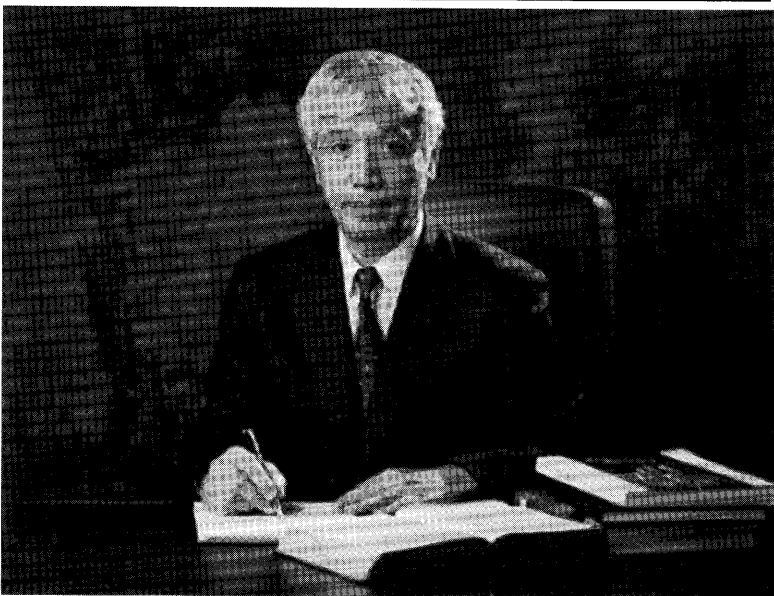
I would like to extend my warmest welcome for you to the 1st International Symposium of the Kanazawa University 21st-century COE Program, with the theme "Environmental Monitoring and Prediction of Long- and Short-Term Dynamics of Pan-Japan Sea Area: Construction of Monitoring Network and Assessment of Human Effects." Pan-Japan Sea area is the most populated and most rapidly developing area in the world. We are at a stage of major transition in environment. With economic growth, recognition of the importance of environment is increasing. Various preventive measures and regulations have been developed to reduce the hazards arisen in countries located Pan-Japan Sea area. Under such circumstances, it is a great honor for us that Kanazawa University was selected as a center of environmental researches in Pan-Japan Sea area. The symposium will be a perfect setting for us to exchange the ideas, research findings, scientific breakthroughs, as well as practical experiences in environmental monitoring and prediction of future change.

KANAZAWA is surrounded by the Japan Alps, Hakusan National Park and Noto Peninsula National Park. Two rivers run through the city. Such a natural background of great beauty gives the city a relaxed feeling. Kanazawa has been ruled over by the Maeda family for three centuries after the first lord Toshiie Maeda entered Kanazawa Castle in 1583. Since then it achieved a high level of craftsmanship that continues to flourish to this day. Kanazawa is also a famous place for eating: *Sashimi* (raw fish), *sushi*, *sake* (Japanese rice wine), and Japanese traditional sweets are the highest quality in Japan.

I hope that this International Symposium will be fruitful and enjoyable to all the people who take part in it. I also hope that you can enjoy your short stay in Kanazawa.



Yujiro HAYASHI
President, Kanazawa University



PROGRAM OVERVIEW

March 16, 2003 (Pre-Symposium Meeting)

	Crustal and Paleo-oceanographic change	Limno-climatic Change	Atmospheric Environment	Environmental Radioactivity	Water and Soil Environments	Ecosystem and Biodiversity
Room			Kenroku (13F)			
9:30 ~ 11:30			Sectional Meeting (p. 9)			
			Lunch			
12:30 ~ 17:30			Sectional Meeting (p. 9)			

March 17, 2003

	Crustal and Paleo-oceanographic change	Limno-climatic Change	Atmospheric Environment	Environmental Radioactivity	Water and Soil Environments	Ecosystem and Biodiversity
9:10 ~ 12:00	Plenary Session (p. 5) (Room: Citymonde Hall, 1F)					
	Lunch					
13:00 ~ 18:15	Plenary Session (pp. 5-6) (Room: Citymonde Hall, 1F)					
18:30 ~ 20:30	Banquet (FEE: JPY6000.) (Room: Kenroku, 13F)					

March 18, 2003

	Crustal and Paleo-oceanographic change	Limno-climatic Change	Atmospheric Environment	Environmental Radioactivity	Water and Soil Environments	Ecosystem and Biodiversity
Room	Kenroku (13F)	Hou-shou-den, (3F)	Citymonde Hall (1F)		Yu-zen (2F)	Revage (3F)
Morning	Sectional Meeting (p. 7)	Business meeting	Sectional Meeting (p. 10)		Sectional Meeting (p. 11) Poster Session (pp. 12-13)	Sectional Meeting (p. 14)
	Lunch					
Afternoon	Sectional Meeting (p. 7)	Sectional Meeting (p. 8)	Sectional Meeting (p. 10)		Poster Session (pp. 12-13) Sectional Meeting (p. 11)	Sectional Meeting (p. 15)
Evening					Free Talking with Light Foods (Fee: JPY1000, Free for students)	

March 19, 2003 (Post-Symposium Meeting)

	Crustal and Paleo-oceanographic change	Limno-climatic Change	Atmospheric Environment	Environmental Radioactivity	Water and Soil Environments	Ecosystem and Biodiversity
Room					Faculty of Sciences, Kanazawa University	
9:30 ~ 11:30					Meeting to Discuss Future Collaborations	

- Plenary Session -

Chairperson: Takuya Kawanishi (Kanazawa Univ.)

9:00 Opening Remarks (Kazuichi Hayakawa, Project Leader, 21st-Century COE Program, Kanazawa University)

9:10 Greetings from Professor Dr. Yujiro Hayashi, the President of Kanazawa University

9:20 Greetings from Dr. Martinez Lestard, the Director, Ishikawa International Cooperation Centre (IICRC)

Radioactivities (Moderator: Kazuhisa Komura)

9:40 K. Komura (Kanazawa Univ., Japan)

001: Environmental Studies Using Low Level Natural and Artificial Radioactive Tracers ····· 17

10:10 M. Hult, J. Gasparro (IRMM, Belgium), P. N. Johnston (Royal Melbourne Institute of Technology, Australia) and M. Köhler (VKTA Rossendorf, Germany)

002: Underground Measurements of Environmental Radioactivity : European Examples ····· 18

Limno-climatic session (Moderator: Kenji Kashiwaya)

10:50 K. Kashiwaya (Kanazawa Univ., Japan)

003: Environmental Changes Printed in Lacustrine Sediments and Earth Surface processes ··· 24

11:20 S. K. Krivonogov (United Institute of Geology, Geophysics and Mineralogy SB RAS, Russia), and H. Takahara (Kyoto Prefectural Univ., Japan)

004: Late Pleistocene and Holocene environmental changes recorded in the terrestrial sediments and landforms of Eastern Siberia and Northern Mongolia. ····· 30

12:00-13:00 Lunch

Crustal and Paleo-oceanographic Change (Moderator: Shoji Arai)

13:00 S. Arai (Kanazawa Univ., Japan)

005: Crustal and Paleo-Oceanographic Change of the Circum-Japan Sea area: A Review ···· 37

13:30 Y-I Lee (Seoul National Univ., Korea)

006: Pre-Miocene Paleogeographic Linkage Between the Korean Peninsula and the Japanese Islands · 42

Water and Soil Environment (Moderator: Kazue Tazaki)

14:10 K. Tazaki, (Kanazawa Univ., Japan)

007: Circumstances of Heavy Oil from Russian Tanker "Nakhodka" in 1997 ····· 48

14:40 R. Fonseca (Creminer-FCUL, Portugal), F. Barriga(Creminer-FCUL, Portugal), and W. Fyfe (Univ. Lisbon, Portugal)

008: Dam Reservoir Sediments as Fertilizers and Artificial Soils. Case Studies from Portugal and Brazil · 55

15:20-15:40 Coffee Break

Atmospheric Environment (Moderator: Chikao Kanaoka)

15:40 C. Kanaoka (Kanazawa Univ., Japan)

009: Atmospheric Environment, Radioactivity and Organic Pollutants in Pan-Japan Sea Area(AERO-PJS) ····· 63

16:10 V. Sergienko (Russian Academy of Sciences, Far Eastern Branch, Russia)

010: Environmental Research for the Sea of Japan and Adjacent Areas: FEB RAS Experience and Prospective ····· 66

Ecosystem and Biodiversity (Moderator: Koji Nakamura)

- 16:50 K. Nakamura, M. Mikage, N. Kamata (Kanazawa Univ., Japan)
011: Impact of Global and Local Environmental Change on Biodiversity 70
- 17:20 A. M. Liebhold (USDA Forest Service, Northeastern Forest Experiment Station, USA)
012: Alien Species, Agents of Global Change Ecology and Management of the Gypsy Moth in
North America as a Case History 71
- 18:00 Wrap-up Discussion (T. Kawanishi)
- 18:15 House Keeping & Closing Remarks (N. Kamata)

Banquet (Room: Kenroku, 13F) Fee: JPY 6,000

- 18:30 Banquet
20:30 Colse

- Crustal and Paleo-Oceanographic Change-

*: speaker

Moderator: Shoji Arai & Takahiro Kamiya (Kanazawa Univ.)

- 9:00 D-C Kim and Y. K. Seo (Pukyong National Univ., Korea)
013: Shallow Gas Deposit and Its Environmental Implications in the Southeastern Part of Korea, the East Sea (Japan Sea) 76
- 9:30 *C. Yatomi and Y. Suzuki (Kanazawa Univ., Japan)
014: Crack Extension Behavior under the Compressive Loads using the Maximum Energy Release Rate Criterion 80
- 10:00 *M. Hori and K. Oguni (Univ. Tokyo: Japan)
015: Application of New Inverse Analysis Method to Crust Deformation of Japanese Islands 85
- 10:30 *S. Arai, Y. Shimizu and S. Ishimaru (Kanazawa Univ., Japan)
016: Petrology of Peridotite Xenoliths from Arcs as an Insight into Wedge-Mantle Processes 89
- 13:00 H. Ohkubo (Kanazawa Univ., Japan)
017: The Correlation of Plio-Pleistocene Strata in Japan Based on Volcanic Ash Keybeds 93
- 13:40 S. Yamada (Kanazawa Univ., Japan)
018: Plio-/Pleistocene Temperate carbonates of the Zukawa Formation, Toyama Prefecture and its comparison with Tropical carbonates 97
- 14:20 T. Kamiya (Kanazawa Univ., Japan)
019: Evolutionary Significance of the Japan Sea, a Marginal Sea, for the Shallow Marine Organisms - A Perspective From Ostracoda (Crustacea) 102
- 15:00 R. J. Smith (Greenwich Univ., UK)
020: Geographical Distributions of Fresh and Brackish Water Ostracods around the Circum-Japan Sea and their Significance 106
- 15:30 Close

- Limno-Climatic Session-

*: speaker

Moderator: Kenji Kashiwaya (Kanazawa Univ.)

10:00 - 12:00 Project meeting

13:00 K. Kashiwaya (Kanazawa Univ., Japan):
Introduction for Limno-climatic session

13:20 T. Sato, N. Hasebe, K. Kashiwaya, S. Tamamura, R. Kizu, K. Hayakawa(Kanazawa Univ., Japan), X. Wang(Nankai Univ., China), and R. Zeng(Chinese Academy of Sciences , China)
021: Records of the Atmospheric Inputs of Loess and Pollutants in Japanese Lake Sediments 111

13:40 *Y. Tanaka (Kyunghee Univ., Korea), Y. Matsukura (Tsukuba Univ. Japan) and T-H Kim (Cheju National Univ., Korea)
022: Difference in Runoff Process between Granite and Gneiss Drainage Basins in Korea 116

14:00 M. Yamamuro and Y. Kanai (Institute for Marine Resources and Environment, AIST, Japan)
023: Natural and Artificial Change in Primary Productivity for 200 Years Recorded in the Coastal Lagoon Sediment 120

14:20 S. K. Krivonogov (United Inst. Geology, Geophysics & Mineralogy SB RAS, Russia)
024: Levels of the Baikal and Hovsgol Lakes in Holocene and Pre-Holocene Time 123

14:40-15:10 Tea break

15:10 *J-Y. Kim (Korea Inst. Geosciences & Mineral Resources, Korea), D.Y. Yang (Chungbug National Univ., Korea), and U.H. Nahm (Mokpo National Univ., Korea)
025: Last Glacial Fluctuation of Fluvial Wetland Environment of Korea - with a Special Reference of Fluvial Organic Mud Formations 128

15:30 H. Takahara (Kyoto Prefectural Univ., Japan)
026: Vegetational Differences between the Coastal Areas of the Japan Sea and the Pacific Ocean Since the Last Interglacial (Isotope Stage 5e) in Western Japan 132

15:50 T. Kawai (Nagoya Univ., Japan)
027: Lake Drilling Sciences for Environmental Change 135

16:10 H. Sakai (Toyama Univ., Japan):
028: Paleoenvironment Deduced from Magnetic Susceptibility Studies on Surface Sediments of Lake Baikal and Lake Biwa 136

16:30 *N. Hasebe and K. Kashiwaya (Kanazawa Univ., Japan)
029: Radiometric Dating of Lake Sediments: A Review 142

16:50-17:30 General discussion

- Atmospheric Environment, Radioactivity and Organic Pollutants in Pan-Japan Sea Area -

*: speaker

9:30 Workshop Welcome and Introductions (Kanaoka)

9:45 "Reviews of Atmospheric Environment in Pan Japan Sea Area (Kanaoka)"

9:45 K. Hayakawa (Kanazawa Univ., Japan)

030: Polycyclic Aromatic Hydrocarbons and Nitropolycyclic Aromatic Hydrocarbons in Airborne
Particulates 145

10:30 Y. Iwasaka (Nagoya Univ., Japan)

031: Atmospheric Environment in East Asia: Importance of the Japan Sea 147

11:00 K. Komura (Kanazawa Univ., Japan)

032: What Can Be Done Using Ultra Low-Level Counting of Environmental Radioactivities? · 152

11:30 Lunch

12:30 "Research proposals in Kanazawa University 21st-century COE Program"(Komura and Nakamura)
"Aerosol and transportation"

12:30 T. Ibusuki (Kanazawa Univ., Japan)

033: Development of Highly Sensitive Environmental Sensors 153

12:50 T. Maeda (Institute for Environmental Management Technology, National Institute of Advanced Industrial
Science and Technology, Japan)034:Analyses of Regional Air Pollution by Sulfur Oxides in East Asia Using A Long-Range
Transport Model 156

13:10 T. Sato (Kanazawa Univ., Japan)

035: Fate of Polycyclic Aromatic Hydrocarbons and Radionuclides through Loess over Pan-Japan
Sea Area - Reaction, Transportation and Deposition- 161

13:30 M. Yamamoto (Kanazawa Univ., Japan)

036: Long-Term and Spatial Variation of Pb-210 and Be-7 Depositions to Ground in Japan · 167

"PAH/NPAH and human effects"

13:50 R. Kizu (Kanazawa Univ., Japan)

037: Role of Aryl Hydrocarbon Receptor in Toxicity of PAHs 168

"Environmental effects on bio-diversity"

14:10 K. Nakamura (Kanazawa Univ., Japan)

038: Degradation of Forest Ecosystem and Biodiversity in Pan-Japan Sea Area 171

"Aerosol sampling and emission control technology"

14:30 C. Kanaoka (Kanazawa Univ., Japan)

039: Developments of Large Volume Classifier for Atmospheric Aerosol and Development of
Appropriate Technology for Controlling Emission 172

14:50 Coffee break

15:10 Discussion "What is the most urgent issues in Pan-Japan Sea Environment? Why? (Kanaoka)

17:30 Close

- Water and Soil Environment Section -

*: speaker

Bioremediation and Heavy Oil (9:00-10:55) Moderator: Koichi Shiraki (Kanazawa Univ.)

- 9:00 * R. Islam and K. Tazaki (Kanazawa Univ., Japan)
050: Bioremediation of As Polluted Groundwater in Bangladesh; Part 3 - Ferrisymplectite ($\text{Fe}_3(\text{AsO}_4)_2 \cdot 6\text{H}_2\text{O}$) Formation in Biomats 209
- 9:20 * M. Agarwal (Planetary & Geosciences Division, Physical Research Laboratory, India)
051: Defluoridation of Water Using Amended Clay 213
- 9:40 * N. Sawano (Seiryō Women's Junior College, Japan)
052: Pursuing Changes on Sandy Beach Environment by using Geo-informatics: Case of Nakhodka Oil Spill incident 217
- 10:00 * T. Seikai (Fukui Prefectural Univ., Japan)
053: Evaluation of Heavy C-oil from Tanker "Nahodka" on the Early Life Stages of Marine Fish under Laboratory Condition 223
- 10:20 * S. Li, (China University of Geosciences, China)
054: Reflectance and Carbon Isotopes of Kerogen in Lower Cambrian Black Shales of Zunyi and Zhangjiajie, Southwest China: Indicators to the source of Au-Ag-PGE 229
- 10:40 Discussion
10:55 Break

Short Presentations of Poster Moderator: Rie Wakimoto (Kanazawa Univ.)

(11:10-12:00)

12:00 Lunch

Poster Session

(13:00-14:30)

Biomineralization (14:30-15:45) Moderator: Ryuji Asada (Kanazawa Univ.)

- 14:30 * V. Okrugin (Institution of Volcanology, FEB RAS, Petropavlovsk-Kamchatskii, Russia), K. Tazaki, K. and N. Bel'kova (Kanazawa Univ., Japan)
055: Hydrothermal Mineral Formation Systems of Kamchatka and the Biomineralization 235
- 14:50 A. Taoka and * Y. Fukumori (Kanazawa Univ., Japan)
056: Biomineralization in *Magnetospirillum magnetotacticum* 239
- 15:10 * K. Aoki and T. Kunimura (Japan Nuclear Cycle Development Institute, Japan), Y. Hirota (Dowa Engineering Co., LTD., Japan) and K. Tazaki (Kanazawa Univ., Japan)
057: Preliminary Microbial Analyses of Groundwater in Horonobe Underground Research Laboratory, Hokkaido, Japan 244
- 15:30 Discussion
15:45 Break

Research Method of Water-Soil Environments (16:00-17:35) Moderator: Osamu Nishikawa (Kanazawa Univ.)

- 16:00 * T. Kawanishi and Y. Hayashi (Graduate School of Natural Science and Technology, Kanazawa Univ., Japan)
058: How Heterogeneity Matters in Water-soil Environmental Research 248
- 16:20 * K. Takayasu and Y. Seike (Shimane Univ., Japan), K. Ayukawa (Environmental System Inc., Japan) and H. Kunii (Shimane Univ., Japan)
059: For the Establishment of Estuarine Environment Monitoring Network 252
- 16:40 * A. Lu (Peking Univ., China)
060: Environmental Property of Mineralogy 256
- 17:00 * N. Yushkin (Institute of Geology, Russian Academy of Sciences, Ural Division, Russia)
061: Human Health Effects of "Table" Minerals 261
- 17:20 Discussion
17:35 Free Talking with Light Foods (Fee: 2000Yen, 500Yen for students)
20:00

Poster Sessions (13:00-14:30)

-- Heavy Oil --

- WSP1 * S. Uesuna and Y. Yamamoto (Meiji Consultant Co., Ltd., Japan)
062: The Current Situation of Investigations and Remediations against Oil Leakage Site in Japan. 266
- WSP2 * Y. Sampei (Shimane Univ., Japan) and K. Tazaki (Kanazawa Univ., Japan)
063: Compositional Changes of Heavy oil and Hydrocarbon from Nahotoka Oil - Primary Change in Spilled Oil during First Month in Seawater - 271
- WSP3 * K. Suzuki, H. Sato, S. Kudo, E. Goto and C. Matsuzawa (Kanazawa Univ. Japan) and K. Ohnishi (Hokuriku Univ., Japan)
064: Degradation of Aromatic Compounds by *Pseudomonas putida* 275
- WSP4 * M. Mitsuno (Daisyohji High School, Japan), K. Tazaki (Dep. of Earth Sciences, Kanazawa Univ., Japan), W. S. Fyfe (University of Western Ontario, Canada), D. Sun (China University of Geosciences, China) and H. Suganuma (Central Research Institute of Electric Power Industry, Japan)
065: Remediation of Desertificated Land with the Coal Ash -- In the Case of Inner Mongolia of China -- 279
- WSP5 * R. Wakimoto, and K. Tazaki (Kanazawa Univ., Japan)
066: Microbes in Oily Hot Spring Water 284
- WSP6 * S. K. Chaerun, K. Tazaki and R. Asada (Kanazawa Univ., Japan)
067: Perlite Rocks as a Beneficial Material in Heavy Oil Bioremediation 290

-- Biomineralization --

- WSP7 * R. Asada, K. Tazaki (Kanazawa Univ., Japan), H. Kimura (Hiroshima Univ., Japan), A. Masta (Univ. of Papua New Guinea) and F. Barriga (Univ. Lisbon, Portugal)
068: Transmission Electron Microscopic Observation of Drilling Microbiological Core Samples from a Deep Seafloor at Hydrothermal Vent Field 294
- WSP8 * S. Imai (INAX Corporation, Japan)
069: Characteristics and Mechanism of Carbonate Precipitates in Life Environment 300
- WSP9 * K. Sato and K. Tazaki (Kanazawa Univ., Japan)
070: Biomineralization of *Leptothrix ochracea* on the Electrode Surface 305
- WSP10 * H. Segawa and K. Sato (Kanazawa Univ., Japan), S. Shiraishi, N. Takahashi and T. Kanemoto (Nissaku Co. Ltd., Japan) and K. Tazaki (Kanazawa Univ., Japan)
071: Observation of Microbial Mats from Drainpipe at the Landslide Area in Takayanagi, Niigata, Japan - Part 2 - Occurrence of Various Diatoms - 310
- WSP11 * T. Nagura (Kanazawa Univ., Japan)
072: The Role of Iron Hydroxide as The Extracellular Matrix around Iron Bacteria 316
- WSP12 * S. Hirashima (Hitachi High-Technologies Corporation, Japan), K. Ishiyama (Medical Incorporated Association of Ishiyama ENT Clinic, Japan) and Y. Une (Laboratory of Veterinary Pathology, School of Veterinary Medicine, Azabu University, Japan)
073: Observation and its Application of the *Helicobacter* by the Variable Pressure Scanning Electron Microscope. 322
- WSP13 * A. Fujisawa and K. Tazaki (Kanazawa Univ., Japan)
074: The Radioactive Microbial Mats - In Case of Misasa Hot Springs in Tottori Prefecture- 328
- WSP14 * K. Miyata and K. Tazaki (Kanazawa Univ., Japan)
075: Fe-As Biomineralization at Shirakami Hot Springs in Aomori Prefecture 332
- WSP15 * S. Moriichi and K. Tazaki (Kanazawa Univ., Japan)
076: Possible Contribution of *Gallionella ferruginea* to the Formation of Limonite Ore Deposits 336
- WSP16 * T. Morikawa and K. Tazaki (Kanazawa Univ., Japan)
077: Influence of Microorganisms on the Formation of Imogolite in Daisen Kurayoshi Pumice - Occurrence of Bio-Imogolite - 340

-- Pollution --

- WSP17 * K. Adachi and Y. Tainosho (Kobe Univ., Japan)
078: Soil Environment Affected by Tire Dust 344
- WSP18 * M. Iwasaki and Y. Tainosho (Kobe Univ., Japan)
079: Study of pine Needles (*Pinus thunbergii*) as an Indicator Atmospheric Heavy Metal Particles 348

WSP19	* Y. Kunimine and K. Tazaki (Kanazawa Univ., Japan)	
	080: Urban Soil Pollution in Kanazawa, Japan	352
WSP20	* N. Koji and K. Tazaki (Kanazawa Univ., Japan)	
	081: The Characteristic Elements of Plants (<i>Pueraria lobata</i> OHWI) in the Artificial Slope	353
WSP21	* Y. Tainosho and A. Nabeshima (Kobe Univ., Japan)	
	082: Heavy Metal Pollution from the Particles in the River Bottom Sediments in Urban	357
WSP22	* K. Tawara, M. Nishijo, H. Nakagawa, R. Honda (Kanazawa Med. Univ., Japan) and T. Kido (Kanazawa Univ., Japan)	
	083: Worldwide Trends of Dioxin Levels in Human Breast Milk With Comparison between Toyama Prefecture in Japan and Other Areas	361
WSP23	* Y. Yagi and Y. Tainosho (Kobe Univ., Japan)	
	084: Chemical characteristic of the street dusts and suspended particulate matter in Kobe City	365
WSP24	K. Kimura, Y. Hayashi, T. Kawanishi, C. Ogino and N. Shimizu, K. Satoh (Kanazawa Univ., Japan)	
	085: Bioassay Using Daphnia Trajectories	369
-- Mineralogy & Petrology --		
WSP25	* M. Okuno, R. Asada, Y. Kitagawa and K. Tazaki (Kanazawa Univ., Japan)	
	086: Techniques for Structural Characterization of Amorphous Materials and an Application to Diatoms	371
WSP26	* Y. Kido (Institute for Frontier Research on Earth Evolution (IFREE), Japan Marine Science and Technology Center (JAMSTEC), Japan)	
	087: Serpentine Landslide Distribution Derived from Magnetic Measurement	375
WSP27	* N. Sasaki and T. Nakamichi (Industrial Research Institute of Ishikawa, Kutani Ware Technology Center, Japan)	
	088: Clay particle size and morphology as factors controlling plasticity	379
WSP28	* I. Saji (Kanazawa Univ., Japan), J. Kimura (Shimane Univ., Japan) and S. Yoshikawa (Osaka City Univ., Japan)	
	089: Chronology of Daisen Plinian Tephra Based on Correlation to the Lake Biwa Borehole Tephra Samples Using LA-ICP-MS Mineral Analysis	383
WSP29	* K. Shimoda, M. Okuno (Kanazawa Univ., Japan) and M. Kikuchi (Tohoku Univ., Japan)	
	090: Structure Evolution of Volcanic Glass by Dynamic Compression	387
WSP30	* K. Shiraki (Kanazawa Univ., Japan), K. Kawamura (Tokyo Institute of Technology, Japan), K. Tomita (Kagoshima Univ., Japan) and K. Tazaki (Kanazawa Univ., Japan)	
	091: Molecular Dynamics Simulations of Systems Including Clay, Water and Organic Matters	393
WSP31	* O. Nishikawa (Kanazawa Univ., Japan)	
	092: Weathering Process in Foliated Rocks	398

19-Mar Meeting to Discuss Future Collaborations

At Faculty of Sciences, Kanazawa Univ.

10:00-12:00 Meeting

- Ecosystem and Biodiversity -

*: speaker

Nitrogen Cycling and Arthropod Population Outbreaks in Forest Ecosystems (8:30-12:00)

Moderator: Naoto KAMATA (Kanazawa Univ.)

8:30 Opening address (N. Kamata)

- 8:40 T. Koike (Hokkaido Univ., Japan)
093: Effects of Defoliation on Defense Characteristics in Leaves of Deciduous Broad-Leaved Tree Species in Changing Environment 402
- 9:05 K. Hikosaka, T. Takashima, D. Kabeya, T. Hirose (Tohoku Univ., Japan), N. Kamata (Kanazawa Univ., Japan)
094: Biomass Allocation and Chemical Defense in Defoliated Seedlings of *Quercus serrata* with Respect to Carbon-Nitrogen Balance 406
- 9:30 L. Koyama (Kanazawa Univ., Japan)
095: Soil Nitrogen Availability as a Controlling Factor of Plant Nitrogen Use and Distribution 410
- 9:55-10:10 Break
- 10:10 N. Kamata, Y. Kuniyoshi, L. Koyama (Kanazawa Univ.), N. Wada (Toyama Univ., Japan)
096: Altitudinal Variation in Beech Foliage Properties: With Special Reference to Insect Outbreaks and Nitrogen Cycling 415
- 10:35 N. Kaneko (Yokohama National Univ., Japan)
097: Linking Species to Ecosystem The Periodical Millipede Determines Nutrient Cycling in a Larch Forest 420
- 11:00 K. Yasue (Shinshu Univ., Japan)
098: Estimation of Environmental Changes by Tree Rings 424
- 11:25 N. Kamata (Kanazawa Univ., Japan)
099: Nitrogen Cycling and Arthropod Population Outbreaks in Forest Ecosystems 428

12:00 End of Morning session

12:00 Business Meeting with Lunch (at any restaurant, not set yet)

Commentators

- Andrew M. Liebhold (USDA Forest Service, USA)
- Naoya Wada (Toyama Univ., Japan)

Ecosystem and biodiversity: monitoring, assessment and conservation in Pan-Japan Sea Area (13:00-17:30)

Moderator: Koji Nakamura (Kanazawa Univ.)

13:00 Opening address (K. Nakamura)

13:10 S. Y. Storozhenko (Entomology Institute of Biology and Soil Science, Far East Branch of Russian Academy of Sciences, Russia)
100: IBOY Activity in Russia and Insect Diversity of the Russian Far East 434

13:40 S. Tanabe, K. Nakamura (Kanazawa Univ., Japan), and M. J. Toda (Hokkaido Univ., Japan)
101: Beyond the DIWPA-IBOY : Monitoring Network and Strategies to Assess Human Impacts on Biodiversity in the Pan-Japan Sea Area 438

14:10 R. Yi (School of Life Sciences, Northwest Univ., China)
102: Establishment of A Primary Monitoring and Assessment System in Giant Panda's Habitat in Changqing National Nature Reserve of China 443

14:40 S-W Cho (Department of Agricultural Biology, Chungbuk National Univ., Korea)
103: Insect Biodiversity Informatics in Korea 447

15:10 Coffee Break

15:20 H. Yamamoto (Wild Bird Society of Japan & Katano Kamoike Bird Sanctuary Friendship Members, Japan), K. Oohata (Katano Kamoike Bird Sanctuary & Wild Bird Society of Japan, Japan), K. Ohkawara (Kanazawa Univ., Japan)
104: Management and Conservation Strategies of Katano-Kamoike, the smallest Ramsar site in Japan 451

15:50 H-S Lee (Eco-Tech Institute of Environmental Ecology & Ornithological Society of Korea, Korea)
105: Population Dynamics and Wintering Status of Baikal Teals *Anas formosa* in Korea 454

16:20 K. Kimura (Kanazawa Univ., Japan)
106: Monitoring Network of Fruit Production and Migratory Frugivorous Birds in Forests of the Pan-Japan Sea Area 456

16:50 Coffee Break

17:00 Discussion

17:45 End

Commentators

Tohru Nakashizuka (Research Institute for Humanity and Nature, Japan)
Masanori Toda (Institute of Low Temperature Science, Hokkaido Univ., Japan)