

PREFACE (Welcome Message)

It is my great pleasure to welcome you to the Tenth Anniversary International Symposium, organized by the Center of Environmental Science and Disaster Mitigation for Advanced Research (CEDAR) at the Muroran Institute of Technology.

A decade ago, CEDAR was established as a multidisciplinary research center to contribute to global and local environmental preservation, new energy development, and disaster mitigation through science and new technologies. During that decade, numerous cooperative research projects, international cooperation, and national projects were undertaken and completed successfully. Those achievements were presented to the public at the annual Joint Seminar on Environmental Science and Disaster Mitigation (JSED). At JSED, all members of CEDAR, including students and invited researchers from overseas, came together for mutual discussion of research results with multilateral perspectives for the next research stage. Because the JSED2015 at this time became a memorial symposium for us, the special lecture opening to the general public about disaster mitigation, and three keynote lectures on new energy, environmental science, and disaster management engineering are programmed in addition to presentations by guest speakers from the universities of academic exchange agreement with Muroran Institute of Technology. I am greatly appreciative of their many and diverse contributions.

I would like to thank all the authors and participants for their respective contributions to the success of the JSED2015, and particularly wish to express our gratitude for the support of the Natural Disaster Research Council, Hokkaido Association for the Preservation of the Environment through Technology (HAPET), Hokkaido Branch of the Mining and Materials Processing Institute of Japan, and the Muroran Institute of Technology.

Finally, on behalf of the Organizing Committee, welcome again to JSED2015. We hope that you will find the seminar both informative and enjoyable, that you will take the opportunity to expand your knowledge of environmental science, energy, and disaster management engineering, and that you will have an impressive stay in Muroran.



Ken-ichi Itakura
General Chair of Organizing Committee, JSED2015
Director of CEDAR, Muroran Institute of Technology



	Room A	Room B
Friday, March 13		
10:00 - 10:10	Opening Remarks	
10:10 - 11:00	Keynote Lecture 1	
11:00 - 11:15	Coffee-Break	
11:15 - 12:15	A1: Unused Resource Energy	B1: Treatment of Environmental Contamination
12:15 - 13:30	Lunch	
13:30 - 14:20	Keynote Lecture 2	
14:20 - 14:30	Coffee-Break	
14:30 - 15:30	A2: Performance Control Structure	B2: Biological Technology and Treatment of Environmental Contamination
15:30 - 15:45	Coffee-Break	
15:45 - 16:30	A3: Environmental Assessment (1)	B3: Biological Technology
16:30 - 17:15	A4: Environmental Assessment (2)	B4: Biological Technology and Hydrogen Energy Applications
18:00	Banquet	
Saturday, March 14		
9:00 - 9:50	Keynote Lecture 3	
9:50 - 10:00	Coffee-Break	
10:00 - 11:00	A5: Crisis Management Systems and Unused Resource Energy	B5: Construction Materials Performance Control
11:00 - 11:15	Coffee-Break	
11:15 - 12:00	A6: Water and Soil Disaster Management	B6: Construction Materials Performance Control and Recycle System
12:00 - 13:00	Lunch	
13:00 - 14:30	Special Lecture	
	Closing Remarks	

The 10th Anniversary International Symposium
of The Center of Environmental Science and Disaster Mitigation
for Advanced Research

Joint Seminar on Environmental Science and Disaster Mitigation Research 2015
(JSED2015)

Environmental, Disaster Prevention, and Energy
– Towards a Livable Future –

Houraiden, Muroran, Hokkaido, Japan
13-14, March 2015.

Friday, March 13

ROOM A

10:00 - 10:10	Opening Remarks	Seiichi Kagaya and Ken-ichi Itakura
10:10 - 11:00	Keynote Lecture 1	

Chair: Ken-ichi Itakura

Derek Elsworth
(Pennsylvania State University, USA)

**Control of permeability and seismicity -- Keys to the successful
development of EGS geothermal reservoirs**

Derek Elsworth¹, Quan Gan¹, Yi Fang¹, Justin Pogacnik², Josh Taron³,
Ghazal Izadi⁴, Yves Guglielmi⁵, Kyunjae Im¹

¹ Pennsylvania State University, ² University of Auckland, ³ United States
Geological Survey, ⁴ Baker Hughes Innovation Center, ⁵ CEREGE
Aix-Marseille Université
pp.K1-K4

A1: Unused Resource Energy

Chair: Tatsuo Iwasa

11:15 - 11:30	Study on supersonic free jets with applications to volcanic eruptions
A1-1	Srishra M V Rao , Asano Shingo , Mitsutomu Hirota, and Tsutomu Saito Muroran Institute of Technology pp.1-4

11:30 - 11:45	Evaluation of gasification zone during underground coal gasification (UCG) experiment using AE technology
A1-2	

Faqlang Su¹, Masahiro Kitagawa¹, Rei Yoshida¹, Shinji Matsubara¹,
Ken-ichi Itakura¹, Kohki Sato¹, Gohta Deguchi², Kotaro Ohga³, and
Junichi Kodama³

¹Muroran Institute of Technology, ² Underground Resources Innovation
Networks, ³ Hokkaido University
pp.5-6

11:45 - 12:00 A1-3	<p>Evaluation of energy recovery during UCG experiment using artificial coalseam</p> <p>Faqiang Su¹, Masahiro Kitagawa¹, Shinji Matsubara¹, Rei Yoshida¹, Ken-ichi Itakura¹, Kohki Sato¹, Gohta Deguchi², Kotaro Ohga³, and Junichi Kodama³</p> <p>¹Muroran Institute of Technology, ² Underground Resources Innovation Networks, ³ Hokkaido University</p> <p>pp.7-8</p>
12:00 - 12:15 A1-4	<p>Comparison of basic soil test methods between Japanese and Vietnamese standards</p> <p>Do Tuan Anh and Yukihiro Kohata</p> <p>Muroran Institute of Technology</p> <p>pp.9-12</p>
13:30 - 14:20	<p>Keynote Lecture 2</p> <p style="text-align: right;">Chair: Koji Nagano</p> <p>Andrzej Lesniak (AGH University of Science and Technology, Poland)</p> <p>Monitoring, mitigation and prevention of the selected natural hazards in Poland and Central Europe</p> <p>Andrzej Lesniak AGH University of Science and Technology pp. K5–K8</p> <p>A2: Performance Control Structure</p> <p style="text-align: right;">Chair: Hiroshi Nagai</p>
14:30 - 13:45 A2-1	<p>Model tests of pulling resistance of helical screw pile</p> <p>Seiya Oka, Tsutomu Tsuchiya, Hiroshi Nagai, and Masao Shimada</p> <p>Muroran Institute of Technology</p> <p>pp.13-16</p>
14:45 - 15:00 A2-2	<p>A aimple calculation method for behaviour of piled rafts subjected to vertical loads</p> <p>Shin-nosuke Kitahara, Tsutomu Tsuchiya, and Hiroshi Nagai</p> <p>Muroran Institute of Technology</p> <p>pp.17-20</p>
15:00 - 15:15 A2-3	<p>Dowel strength of reinforced concrete member</p> <p>Kenya Hanaki and Mitsuo Mizoguchi</p> <p>Muroran Institute of Technology</p> <p>pp.21-24</p>
15:15 - 15:30 A2-4	<p>Loading tests of RC wall Panels with openings</p> <p>Yoshihiro Komatsu and Mitsuo Mizoguchi</p> <p>Muroran Institute of Technology</p> <p>pp.25-28</p>

A3: Environmental Assessment (1)

Chair: Shima Kawamura

15:45 - 16:00
A3-1

Landfill gas and temperature distributions in passive landfill gas extraction wells of a semi-aerobic landfill

Hideki Yoshida
Muroran Institute of Technology
pp.29-30

16:00 - 16:15
A3-2

Measurement of the surface temperature of the ground with autonomous vehicle

Shuto Otani, Wataru Otake, Wei Luo, Naohiko Hanajima, and
Hideki Yoshida
Muroran Institute of Technology
pp.31-32

16:15 - 16:30
A3-3

Force analysis of walking motion using dynamics simulation for a double spiral mobile robot

Yuki Monoi, Taiki Kaneko, Naohiko Hanajima, Manda Huhe, and
Kunio Kawauchi
Muroran Institute of Technology
pp.33-34

A4: Environmental Assessment (2)

Chair: Jun Maeda

16:30 - 16:45
A4-1

A case study in supermarket to gain recognition of carbon footprint

Koji Nagano¹, Akinori Suzuki², and Zhao Peijiang¹
¹Muroran Institute of Technology, ²CO-OP Sapporo
pp.35-36

16:45 - 17:00
A4-2

A proposal of web-based energy management system for unstable community wireless network

Pramesh Shrestha, Dibesh Shrestha and Kazuhiko Sato
Muroran Institute of Technology
pp.37-38

17:00 - 17:15
A4-3

Iwor and Siida as the basis of nature-based culture

Takashi Matsuna
Muroran Institute of Technology
pp.39-42

ROOM B

B1: Treatment of Environmental Contamination

Chair: Yasuharu Kanda

11:15 - 11:30

B1-1

Hydrothermal treatment on fixation mercury in pencil-scale reactor

Riky Stepanus Situmorang¹, Tsuyoshi Suzuki¹, Hideki Kawai¹, and Hiroshi Nogami²

¹ Muroran Institute of Technology, ² Tohoku University

pp.65-66

11:30 - 11:45

B1-2

ROS/RNS production using packed-bed dielectric barrier discharge

Shogo Hosoi¹, Daisuke Nishioka¹, Kazuhiro Takahashi¹, Kohki Satoh¹, Hidenori Itoh¹, Hideki Kawaguchi¹, Igor Timoshkin², Martin Given², and Scott MacGregor²

¹ Muroran Institute of Technology, ² University of Strathclyde

pp.67-68

11:45 - 12:00

B1-3

Production characteristics of ROS/RNS in water after DC corona discharge exposure

Hayato Kawanami¹, Kohki Satoh¹, Hidenori Itoh¹, Hideki Kawaguchi¹, Igor Timoshkin², Martin Given² and Scott MacGregor²

¹ Muroran Institute of Technology, ² University of Strathclyde

pp.69-70

12:00 - 12:15

B1-4

Phenol, alkylphenols, and polycyclic aromatic hydrocarbons (PAHs) degradation using the bacteria hydrogenophaga palleronii

M. Venkateswar Reddy, Young-Cheol Chang, and Shintaro Kikuchi

Muroran Institute of Technology

pp.71-74

B2: Biological Technology and Treatment of Environmental Contamination

Chair: Kiyotaka Tokuraku

14:30 - 14:45

B2-1

Inexpensive method for biodiesel production over CaO derived from scallop shell

Frisda R. Panjaitan, Shinya Yamanaka, Toshiyuki Fujimoto, and Yoshikazu Kuga

Muroran Institute of Technology

pp.75-76

14:45 - 15:00

B2-2

Low temperature synthesis of rhodium phosphide on Al₂O₃ and catalytic activity for hydrodesulfurization

Yasuharu Kanda, Yuki Matsukura, Ayaka Sawada, and Yoshio Uemichi

Muroran Institute of Technology

pp.77-78

15:00 - 15:15

B2-3

Preparation and photocatalytic activity of titania-coated magnetic photocatalysts

Wuyun, Gang Dai, and Tana

Inner Mongolia Normal University

pp.79-82

15:15 - 15:30 B2-4	Downsized spot of localized surface plasmons by using silica coated metal film M. Syafiq Syahmi, Kento Chiba, and Hiroshi Kano Muroran Institute of Technology pp.83-84
	B3: Biological Technology Chair: Shinya Yamanaka
15:45 - 16:00 B3-1	Highly sensitive detection of mercury (II) Using a G-rich oligonucleotide based fluorescence quenching method Jun Ai ¹ and Guohong Yun ² ¹ Inner Mongolia Normal University, ² Inner Mongolia University pp.85-86
16:00 - 16:15 B3-2	Development of a microliter-scale high-throughput screening system for amyloid aggregation inhibitors using bio-nanoimaging technology Kiyotaka Tokuraku and Koji Uwai Muroran Institute of Technology pp.87-88
16:15 - 16:30 B3-3	Three retinal proteins from the cell membrane of Halorubrum species found from Ejinoor ChaoLuomeng ¹ , Gang Dai ² , Takashi Kikukawa ³ , Kunio Ihara ⁴ , and Tatsuo Iwasa ¹ ¹ Muroran Institute of Technology, ² Inner Mongolia Normal University, ³ Hokkaido University, ⁴ Nagoya University pp.89-90
	B4: Biological Technology and Hydrogen Energy Applications Chair: Hiroshi Kano
16:30 - 16:45 B4-1	Effects of scallop shell extract on scopolamine-induced memory impairment Satoshi Kawaminami, Miho Fujita, and Yasushi Hasegawa Muroran Institute of Technology pp.91-92
16:45 - 17:00 B4-2	Expression and structural analysis of two kinds of perireceptor proteins (PRPs) as the sensor element of a bioinspired electricnose Xing Li, Wendurige, Masaru Hojo, Mamiko Ozaki, Tatsuo Iwasa Muroran Institute of Technology pp.93-94
17:00 - 17:15 B4-3	Hydrogenation property of Ca coated hyper-eutectic Mg-Ni hydrogen absorption alloy by high-speed rotational impact blending method Shota Ishikawa , Yoshinori Tayu and Hideyuki Saitoh Muroran Institute of Technology pp.95-96

Saturday, March 14

ROOM A

- 9:00 - 9:50 **Keynote Lecture 3**

Chair: Yukihiro Kohata

Susumu Yasuda
(Tokyo Denki University, Japan)

Restoration of the residential areas damaged due to soil liquefaction during the 2011 Great East Japan Earthquake
Susumu Yasuda
Tokyo Denki University
pp.K9-K12

A5: Crisis Management Systems and Unused Resource Energy
Chair: Yukio Hama
- 10:00 - 10:15 **Development of spread type psychodrama for trauma and loss & grief**
A5-1 Jun Maeda
Muroran Institute of Technology
pp.43-44
- 10:15 - 10:30 **An evaluation of the public response to communicating channels of**
A5-2 **natural hazard warnings**
Norman K.W. Cheung¹ and Benjamin J. Axelsen²
¹ Kingston University, ² Emergency Planning Resilience and Response
pp.45-48
- 10:30 - 10:45 **Evaluation of the effect of mutual assistance in evacuation by using the**
A5-3 **multi agent simulation**
Naotaka Ikutomi, Takaya Yamashiro, Mikiharu Arimura, Takumi Asada, and
Hideki Yoshida
Muroran Institute of Technology
pp.49-52
- 10:45 - 11:00 **Production gas monitoring in UCG experiment**
A5-4 Kazuhiro Takahashi¹, Kohki Satoh¹, Ken-ichi Itakura¹, and Gota Deguchi²
¹ Muroran Institute of Technology, ² Underground Resources Innovation
Networks
pp.53-54

A6: Water and Soil Disaster Management

Chair: Hideki Yoshida

11:15 - 11:30
A6-1

Research on optimization of the parameters of flood runoff model using GIS

Li Ren-zhi¹, Soichiro Okuizumi², and Makoto Nakatsugawa²

¹ Henan Polytechnic University, ² Muroran Institute of Technology

pp.55-58

11:30 - 11:45
A6-2

Hydraulic and numerical experiments on a damaged vehicle due to wave overtopping at a slipway adjoining a coastal road

Masashi Ochi and Katsutoshi Kimura

Muroran Institute of Technology

pp.59-60

11:45 - 12:00
A6-3

Stability monitoring of road embankments in cold regions and its evaluation

Koki Fukutsu and Shima Kawamura, and Makoto Nakatsugawa

Muroran Institute of Technology

pp.61-64

13:00 – 14:30

Special Lecture (Public Lecture)

Chair: Yukihiro Kohata

Yoshiaki Kawata

(Kansai University, Japan)

災害の多発・激化時代におけるわが国の防災・減災対策

河田恵昭

関西大学 社会安全研究センター センター長

pp.S1-S4

ROOM B

B5: Construction Materials Performance Control

Chair: Noriyuki Sugata

10:00 - 10:15
B5-1

Performance evaluation of surface modified material on the assumed winter concrete construction

Feng Chen, Yukio Hama, Yuya Homma, and Wenyan Zhang
Muroran Institute of Technology
pp.97-100

10:15 - 10:30
B5-2

Self-healing performance of 38 years fly ash concrete cored from actual concrete structure exposed to natural environment

Yasuyoshi Tsukamoto¹, Yukio Hama¹, Takahiro Sagawa², Seung-Hyun Na², and Mohamed Zakaria³
¹ Muroran Institute of Technology, ² NIPPON STEEL & SUMIKIN CEMENT Co.,Ltd., ³ Aswan University
pp.101-104

10:30 - 10:45
B5-3

Coupled deterioration property under carbonation and frost damage mortar with blast furnace slag]

Wenyan Zhang, Yukio Hama, Keisuke Nakamura
Muroran Institute of Technology
pp.105-108

10:45 - 11:00
B5-4

Establishment of the thermodynamic non-equilibrium freezing probability prediction model Based on probability distribution taking into account supercooling phenomenon in mortar

Yoshihiko Kishimoto, Kei Murayama, and Yukio Hama
Muroran Institute of Technology
pp.109-112

B6: Construction Materials Performance Control and Recycle System

Chair: Yoshihiko Kishimoto

11:15 - 11:30
B6-1

Strength and shrinkage properties of high-strength concrete containing ground-granulated blast-furnace slag and silica fume

Keisuke Yokokawa and Noriyuki Sugata
Muroran Institute of Technology
pp.113-114

11:30 - 11:45
B6-2

Recycling of worn rolls for the production of knives for cutting of sheet products

Khlestov V.M., Efremenko V.G., Cheiliakh A.P., and Buslov V.I.
Priazovskyi State Technical University
pp.115-116

11:45 - 12:00
B6-3

Recycling of solid municipal wastes in Ukraine

Oleksandr Cheiliakh, Vyacheslav Voloshyn, Inna Oliynik, and Victoriea Ivashchenko
Priazovskyi State Technical University
pp.117-120

Production of Molecular Hydrogen by Photosynthetic Bacteria in the South Hokkaido region

Gen Kodate, Syun Murayama, Tatsuya Sato, and Masahiro Hibino

Muroran Institute of Technology

pp.121-122

Self-Assembly of Cholesterol and Cholesteryl Esters at the Liquid-Solid Interface

Masahiro Hibino¹ and Hiroshi Tsuchiya²

¹ Muroran Institute of Technology, ² Sharp Corporation

pp.123-124

Functionalized CNTs- and Inorganic Materials-Polymer Electrolyte Nanocomposite Membrane for Nonhumidified High Temperature Proton Exchange Membrane Fuel Cells

Hiroyoshi Tanabe, Wataru Miyajima, and Naofumi Yoshida

Muroran Institute of Technology

pp.125-126