



International Center for Urban Safety Engineering (ICUS)

Annual Report -2005-



Staff Members (ICUS)

(2005)

Sustainable Engineering Division

- Prof. Taketo UOMOTO (Director and Professor)
- Prof. Reiko AMANO (Visiting Professor)
- Dr. Yoshitaka KATO (Assistant Professor)
- Mr. Toshio TOKUDA (Visiting Researcher)



Urban Safety and Disaster Mitigation Division

- Prof. Kimiro MEGURO (Professor)
- Prof. Shogo HAYASHI (Visiting Professor)
- Dr. Dushmanta DUTTA (Associate Professor)
- Dr. Ansary Mehedi AHMED (Associate Professor)
- Dr. Miho YOSHIMURA (Research Associate)



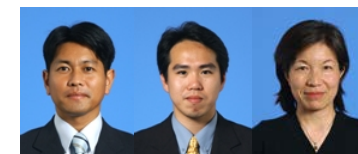
Infrastructure Information Dynamics Division

- Dr. Ryoza OOKA (Associate Professor)
- Dr. Taikan OKI (Associate Professor)
- Dr. Junichi SUSAKI (Assistant Professor)
- Dr. Takahiro ENDO (Research Associate)



Researcher and Secretary

- Dr. Hisashi KANADA
- Dr. Raktipong SAHAMITMONKOL
- Ms. Eiko YOSHIMOTO





Staff Members (ICUS)

(2005)



Research Topics of ICUS

(2005)

Sustainable Engineering Division

- Deterioration mechanism of existing structures
- Nondestructive testing technology for evaluation of deterioration
- Retrofitting and strengthening of structures considering deterioration mechanism
- Standard specification for design, construction and maintenance of structures
- Maintenance and management plan



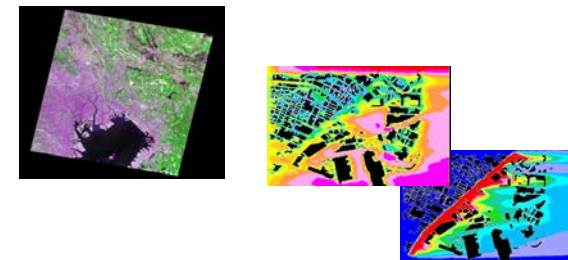
Urban Safety and Disaster Mitigation Division

- Urban safety and disaster mitigation strategies
- Efficient and economic retrofitting method for masonry structures considering local availability of materials and workmanship
- Disaster countermeasures for urban lifeline systems
- Development of integrated information system for total disaster management



Infrastructure Information Dynamics Division

- Remote sensing/geographic information system
- Spatial data analysis
- Urban warming/comprehensive environmental assessment
- Simulation of urban fire
- Development of water hazard warning system





Research Topics (2005)

- Sustainable Engineering -

- Evaluation of long-term durability performance of concrete using epoxy-coated reinforcing steel bars
- Influence of various factors on deterioration of repaired concrete structures
- Development of monitoring system for existing concrete bridges
- Application of near-infrared (NIR) spectroscopy for inspection of concrete structures
- Development of recycle concrete using low quality recycle aggregates
- Development of inspection and diagnosis software for tunnel structures
- Study on fracture mechanics of steel bar due to Alkali-Silica reaction
- Evaluation of concrete quality using multiple Non-destructive testing
- Management of concrete structures' maintenance based on risk evaluation
- Modeling of concrete structures' deterioration considering non-homogeneous media
- Evaluation of environmental impacts on concrete structures using computational fluid dynamics (CFD)
- Development of new repair technique for aesthetic appearance performance of concrete structures
- Water screen fire disaster prevention system



Research Topics (2005)

- Urban Safety and Disaster Mitigation -

- Development of integrated information system for total disaster management
- Development of next generation disaster management manual for implementation of efficient countermeasures
- Quick estimation and monitoring of earthquake damage using power supply changes
- System for promotion of retrofitting of low earthquake resistant structures
- Numerical simulation of total collapse behaviour of structures
- Efficient and economic retrofitting method for masonry structures considering local availability of materials and workmanship
- Development of human evacuation model for tsunami disaster mitigation

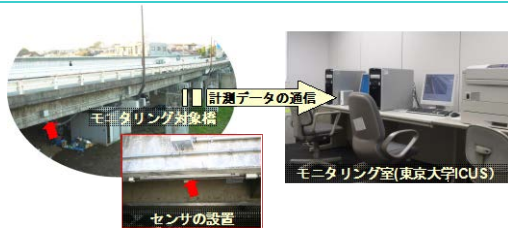


Research Topics (2005)

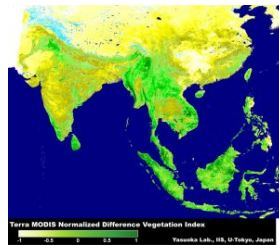
- Infrastructure Information Dynamics -

- Monitoring of the environment in East Asia using satellite data (TERRA/MODIS), (forest fires, extraction of 3D surface feature, albedo, etc.)
- 3D city modeling using data from airborne laser scanning and digital camera
- Estimation of precipitable water distribution over land using NOAA/AVHRR Data and GPS-derived Precipitable
- Evaluation and measurement of urbanization of mega cities in Asia
- Relaxation effect of urban greening on urban heat island
- Urban fire simulation using computational fluid dynamics (CFD) method
- Prediction of air pollution by wind tunnel experiment and numerical simulation
- Study on the mechanism of CO₂ emission in urban region
- Development of real time river discharge forecasting system
- Development of a system to enhance the accuracy of low-cost GPS observations
- Study on spatial distribution of disaster logistics by GIS
- Development of agricultural drought monitoring system from satellite and meteorological data

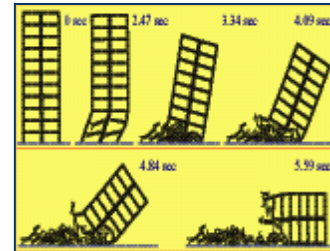
Research and Investigation (2005)



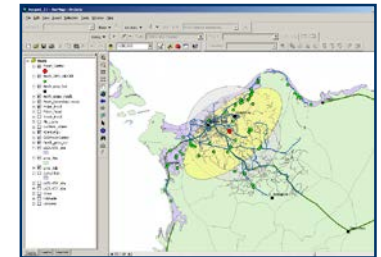
Investigation of structural degradation



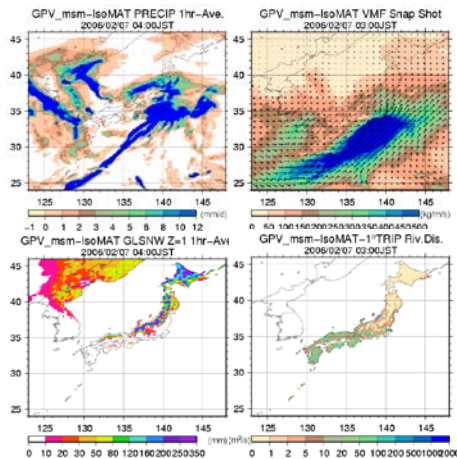
Vegetation activity monitoring



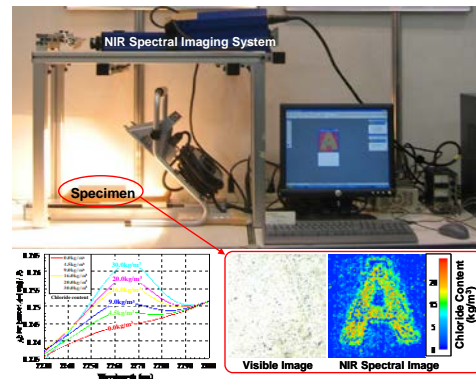
Earthquake disaster simulation



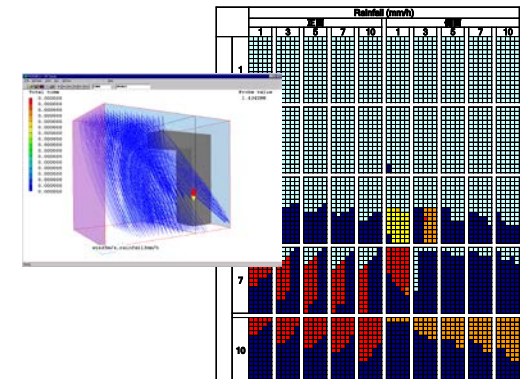
Probable disaster logistics distribution in Banda Ache, Indonesia



Real time flood simulation



Componential analysis of concrete by NIR spectral imaging system

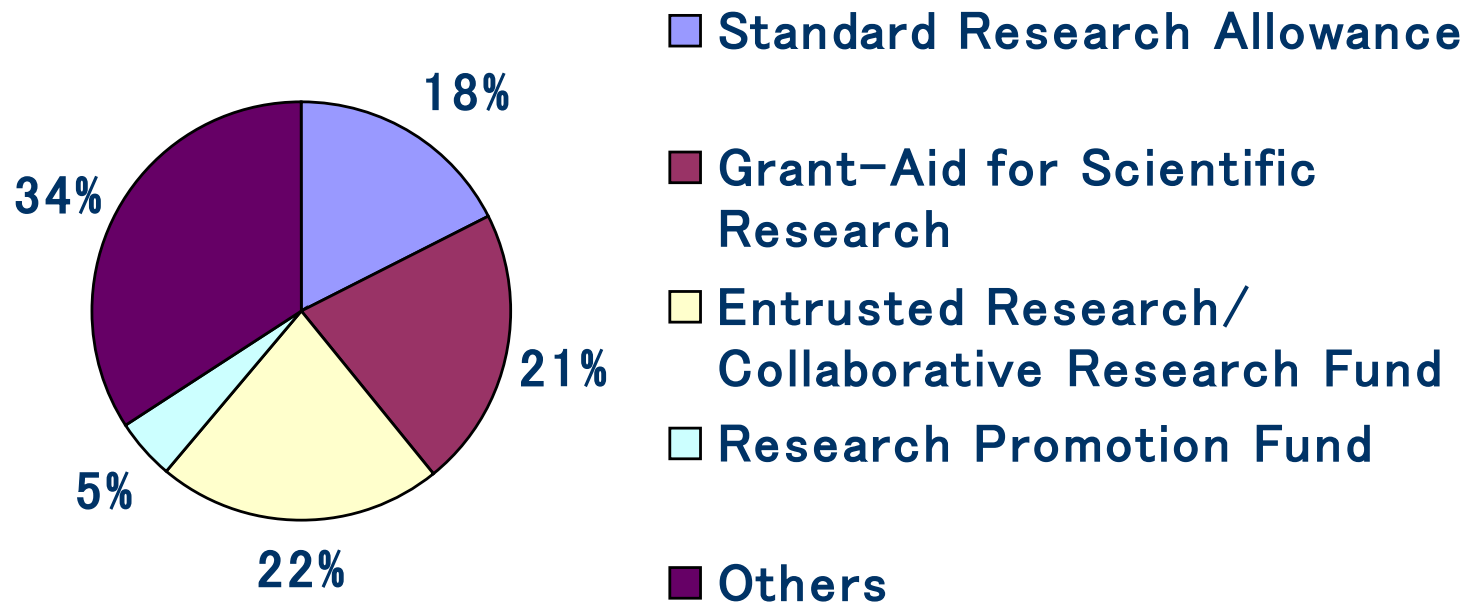


Evaluation of environmental impacts using CFD



Budget

(2005)





Projects (2005)

- Sustainable Engineering -

Grant-in-Aid for Scientific Research

- Utilization of Multimedia Hazard Map for Disaster Prevention in Megacities through Optimum Urban Planning

Research Promotion Fund

- Analysis and Evaluation of Basic Data for Development of Sensing Technology for Concrete Structures by Multi-Spectral Method
- Case Study on Seismic Diagnosis and Earthquake Retrofit for Disaster Prevention Officers of Local Governments - no.2 -
- Effect of Chemical Admixtures on Shrinkage of Hardened Cement Paste
- Application of Fly Ash as Concrete Ingredient in Thailand

Collaborative Research

- Development of Advanced Maintenance and Monitoring System for Concrete Bridges
- Development of Inspection and Diagnosis Software
- Study on the Evaluation of Repair Materials for Concrete Structures
- Development of New Techniques of Non-Destructive and Non-Contact Test for Inspection of Concrete Structures
- Development of Disaster Prevention Manual for The University of Tokyo Hospital

Others

- Investigation of Deteriorated Concrete Bridges in Bangkok



Projects (2005)

- Urban Safety and Disaster Mitigation -

Grant-in-Aid for Scientific Research

- Development of Evaluation Method of Regional Multi-Hazard Vulnerability
- Development of an Integrated Assessment Program for the Sustainability, Safety and Security of Urban Underground Infrastructure
- Development of Technical and Social Systems for Promotion of Retrofitting of Weak Structures against Earthquakes

Special Coordination Funds for Promoting Science and Technology

- Special Coordination Funds for Promoting Science and Technology (RR2002)
 - Special Project for Urban Earthquake Disaster Mitigation
 - “Study for Integrated Earthquake Disaster Reduction Countermeasures -Pre-Event Measures”
 - “Development of Integrated Numerical Simulator for Tsunami Disaster in Coastal Region”
- Social Technology Research System
 - “New Technology for Earthquake Risk Assessment, Disaster Mitigation and Crisis Management”



Projects (2005)

- Urban Safety and Disaster Mitigation

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Research Promotion Fund

- Disaster Reduction by Proper Crisis Management of Information Technology
- Development of Crisis Management System for Japanese Society

Cooperative Research

- Dynamic and Large Deformation Analysis of Railway Structures
- Integrated Earthquake Disaster Management System for Tank Yards with Quick Damage Estimation and Alert Functions using Real-time Earthquake Information

Others

- Development of Disaster Management Manual System for The University of Tokyo Hospital Considering its Functions as Emergency Base Hospital
- Research Project of Japan Bank for International Cooperation
“Proposal of Retrofitting Technique of Masonry Structures with PP-band Meshes”
- Project for Promoting Construction Technologies in Developing Countries by International Development Institute, Japan
“Proposal of Simple Retrofitting Technique”



Projects (2005)

- Infrastructure Information Dynamics -

Grant-Aid for Scientific Research

- Development of Network for Monitoring Natural Disasters in Asia using Satellite Remote Sensing (JST: Japan Science and Technology Agency)
- Modeling Global Hydrological Cycles and World Water Resources Coupled with Human Activities (JST: Japan Science and Technology Agency)
- Development of Optimum Design Method for Outdoor Environment using Multi-objective Genetic Algorithm
- Life Cycle Value Evaluation of Sustainable Building by Contingent Valuation Method (CVM)

Research Promotion Fund

- The Application and Development of Geothermal Air-Conditioning System using Ground Heat Exchanger and Utilizing Building Foundation Pile in Urban Area (NEDO: New Energy and Industrial Technology Development Organization)
- A Pilot Study of Effective and Integrated Water Resources Management Based on a Global Earth Observation System (MEXT: Ministry of Education, Culture, Sports, Science and Technology)

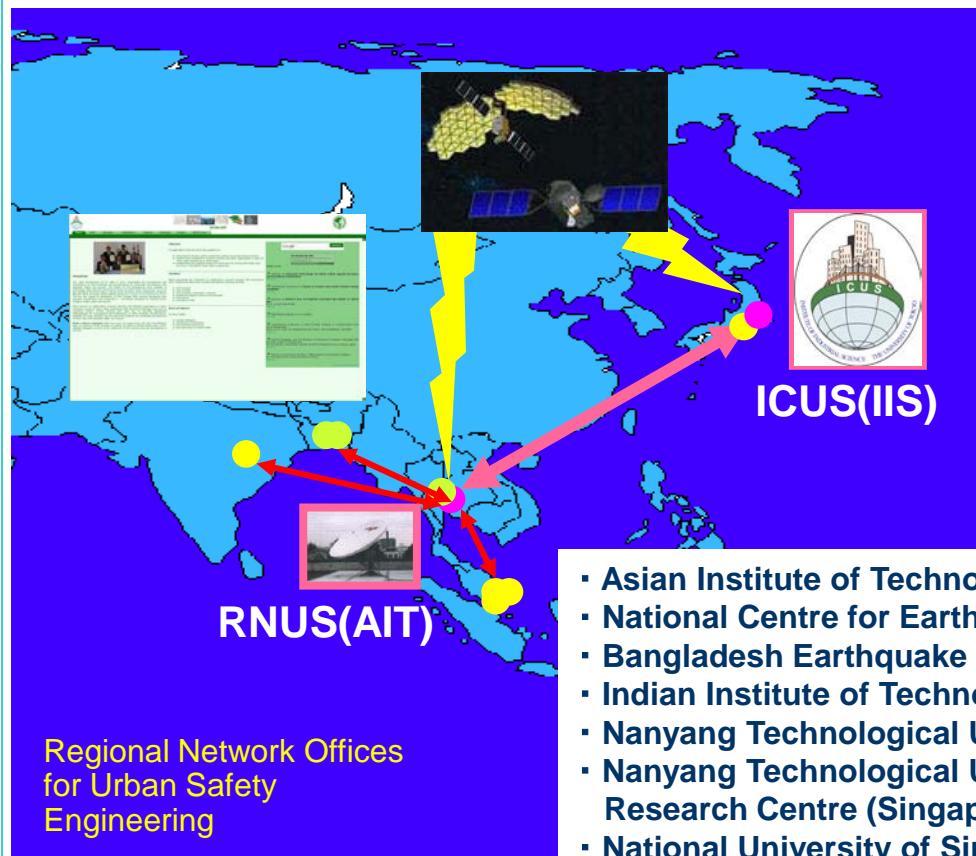
Collaborative Research

- Basic Analytical Research of the Factors Influencing Outdoor Thermal Environment at Residential Scale – Mechanism Clarification of New Phenomenon and Application Development
- Study on the Influence of Air-Conditioning Systems and Distributed Local Energy Supply Systems on Heat-Island Phenomenon
- Integrated Water Management System for Future –Basin Aspect–



Global Network

(2005)



Memorandum of Understanding and Joint Research Network

- Asian Institute of Technology (Thailand)
- National Centre for Earthquake Engineering (Bangladesh)
- Bangladesh Earthquake Society (Bangladesh)
- Indian Institute of Technology, Kanpur (India)
- Nanyang Technological University, College of Engineering (Singapore)
- Nanyang Technological University, Protective Technology Research Centre (Singapore)
- National University of Singapore, Dept. of Civil Engineering (Singapore)
- LCM Research Center, The Port and Airport Research Institute (Japan)



International Activities

(2005)

Regional Network Office for Urban Safety (RNUS), AIT, Thailand

Projects

- Catastrophic Flood Risk Analysis in Bangkok, Thailand
- Flood Forecasting and Decision Support System for Chao Phraya River Basin, Thailand
- An Assessment of the Socio-economic Impacts of Floods under Climate Change Conditions in Large Coastal Cities in South and Southeast Asia

Workshops

- International Symposium on “Role of Water Sciences in Transboundary River Basin Management,” Ubon Ratchathani, Thailand, March 2005
- Brainstorming Workshop “An Assessment of the Socio-economic Impact of Floods under Climate Change Conditions in Large Coastal Cities in South and South-east Asia,” AIT, Thailand, March 2005
- International Symposium on “Floods in Coastal Cities under Climate Change Conditions,” AIT, Thailand, June 2005

Seminars

- RNUS Seminar – Oct 20th, 2005
Prof. T. Uomoto (ICUS), Prof. R. Amano (ICUS), Prof. K. Meguro (ICUS), and Associate Prof. R. Ooka (ICUS)
- RNUS Seminar – Jan 17th, 2006
Prof. T. Nawa (Hokkaido Univ., Japan), Prof. S. Tangtermsirikul (Thammasat Univ., Thailand), and Dr. P. Termkhajornkit (Hokkaido Univ., Japan)
- Special Seminar – March 15th, 2006
Prof. H. Mutsuyoshi (Saitama Univ., Japan)



Activities

(2005)

Domestic

- SEIKEN Open House (June 2-3, 2005) IIS
- 9th ICUS Open Lecture (September 29, 2005) IIS
“Structure and Safety of Our Country”
- 10th ICUS Open Lecture (March 16, 2006) IIS
“Communication of Safety Science and Technologies”
- Chiba Experimental Laboratory Open House
(November 11, 2005) Chiba
- Maintenance Techno-Show (November 15-18, 2005) Tokyo
- 10th Earthquake Technology Expo (February 2-3, 2006) Yokohama
- Research Group Meeting on Disaster Reduction by Integration of
Different Research Fields’ Results (6 times/Year) Tokyo

International

- 4th International Symposium on
“New Technologies for Urban Safety of Mega Cities in Asia,” October 18-19, 2005,
Nanyang Technological University, Singapore

Activities (2005)

- Open House -

“SEIKEN Open House”



ICUS open house of was held in conjunction with IIS open house.



Activities (2005)

- Open Lecture -

Photographs taken at the “9th ICUS Open Lecture”



Activities (2005)

- Workshop -

4th International Symposium on “New Technologies for Urban Safety of Mega Cities in Asia,” October 18-19, 2005, Nanyang Technological University, Singapore



Activities (2005)

- Industry-University Joint Research -

Three working groups have been organized for conducting the activities of Research Committee 39 (RC39). The themes of these working groups are: 1) Aging infrastructure management, 2) Disaster mitigation, and 3) Environment.



Bridge Vibration Measurement



Extraction of Environmental Evaluation Index derived from LANDSAT Data (Bangkok, Thailand)



Publications

(2005)

ICUS Newsletter

Volume 5 Number 1-4

ICUS Report

2005-01 - 2005-05

- “Report on the 2004 Sumatra Earthquake and Tsunami Disaster”
- “Report on Development of Health Monitoring System for Concrete Bridges”
- “Report on the 8th ICUS Open Lecture”
- “Proceedings of the Forth International Symposium on New Technologies for Urban Safety of Mega Cities in Asia”
- “Report on the 9th ICUS Open Lecture”

ICUS Research Committee Report 2005-01

SEIKEN SYMPOSIUM 42

KNOW RISK

The 4th workshop for “Comparative Study on Urban Earthquake Disaster Management”

Annual Report

ICUS Newsletters were sent to over 1,500 network members from about 150 countries, foreign embassies, consultants, researchers, engineers and practitioners.

The newsletters can be downloaded from “<http://icus.iis.u-tokyo.ac.jp/>” free of charge.



Research Papers

(2005)

	Sustainable Engineering Division	Urban Safety and Disaster Mitigation Division	Infrastructure Information Dynamics Division
IIS Bi-monthly Research Report (SEISAN KENKYU)	17	8	10
Books/Translated Books	0	2	3
Reviewed Papers/Journal Papers	18	9	39
Conference Papers (International)	12	31	33
Conference Papers (Domestic)	32	25	84
Survey Reports	2	1	0
Others	3	10	8
Total	84	86	177



Awards

(2005)

Name	Date	Prize Name	Organization	Supervisor
T. OKI	May 2005	Environmental award	JSCE	Associate Prof. OKI
R. OOKA	May 2005	Technology promotion award	SHASE	Associate Prof. OOKA
M. ITO	June 2005	Technical paper award	JCI	Prof. UOMOTO
T. UOMOTO	July 2005	Distinguished service person	JCI	Prof. UOMOTO
R. OOKA	Sep. 2005	Excellent presentation award	JSHEs	Associate Prof. OOKA
S. ELKHOLY	Dec. 2005	Award of the Best Paper of the Year by Young Researchers	JSCE	Prof. MEGURO
D. ITO	Dec. 2005	Excellent presentation award	JSCE	Prof. MEGURO
T. NANJO	Dec. 2005	Excellent presentation award	JSCE	Prof. MEGURO
N. TAKESHITA	Dec. 2005	Excellent presentation award	JSCE	Dr. KATO

JSCE: Japan Society of Civil Engineers

JCI: Japan Concrete Institute

SHASE: The Society of Heating, Air-Conditioning and Sanitary Engineers of Japan

JSHEs: The Japanese Society of Human-Environment System

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