



ICUS

International Center for Urban Safety Engineering,
Institute of Industrial Science, The University of Tokyo

Annual Report 2011



Research topics

Urban Safety and Disaster Mitigation Division

- urban safety and disaster mitigation strategy
- development of temporal-spatial disaster process model
- implementation of earthquake safer masonry structures
- disaster information dissemination to diverse communities including foreigners
- development proper disaster broadcast model by mass-media

- development of IT triage system
- effective Use of Disaster Information
- development of assessment method of vulnerability and fragility to natural hazard
- restructure of urban mitigation planning theory
- post-disaster recovery and rehabilitation planning
- development of planning support technologies

Sustainable Engineering Division

- life cycle and stock management
- technology management
- ground maintenance and sustainability
- ground improvement

Infrastructure Information Dynamics Division

- assessment and adaptation to climate change
- application of remote sensing technology to great disaster
- monitoring and conservation of biodiversity
- damage survey of wooden houses
- monitoring of the secular change of a timber bridge
- urban traffic management

Activities &Event

04/21 @IIS

20th ICUS Open Lecture,

“The mission of new ICUS towards sustainable urban systems /

Urgent report on the East Japan Great Earthquake disaster and its implications”

06/02-04 @IIS

Open House

08/01-02 @AIT (Bangkok)

4th Joint Student Seminar on Civil Infrastructure

10/12-14 @Chiang Mai

10th International Symposium on New Technologies for Urban Safety of Mega Cities in Asia (USMCA2011)

10/31 @Hokkaido Univ.

21st ICUS Open Lecture, “Towards formulation of sustainable urban infrastructure systems”



USMCA

Venus : The Empress Hotel (Chiang Mai, Thailand)

Participants : 149

Key note speakers · Dr. Shunichi Koshimura (Tohoku University)

The 2011 Tohoku Earthquake Tsunami disaster: Its impact, lessons and renovation

· Dr. Ir. Muhammad Dirhamsyah (Syiah Kuala University)

An application of geographic information system for Aceh multi-hazard disaster

· Dr. Sidthinat Prabudhanitisarn (Chiang Mai University)

Environmental management

· Prof. Peter Rogers (Harvard University)

Energy, food and water security: Implications for Asian megacities

· Prof. Haruo Sawada (ICUS)

Satellite information for large natural hazard



Urban Safety & Disaster Mitigation Division



Research Themes

- development of integrated information system for total disaster management
- efficient and economic retrofitting method for masonry structures considering local availability of materials and workmanship
- research on estimation of electric power demand after large-scale earthquake disaster
- development of Mass-media model for disaster information to contribute effective and efficient disaster responses during the time of digital broadcasting.
- development of temporal-spatial disaster process model
- development of IT triage system (TRACY) for sharing disaster medical information during large scale disasters
- effective Use of Earthquake Early Warning in Manufacturing Companies
- study on Distribution of Evacuation Space / Buildings during Large-scale Metropolitan Flood
- Study on Earthquake Disaster Prevention Strategy and Damage Estimation
- Urban Strategy and Evacuation Planning against Large-scale Flood
- Practical Study on Local Community Collaborative Activities Adaptable for Climate Change in Below-sea-level Cities
- Development of Comprehensive Method of Advanced Community-based Activities and Planning for Disaster Prevention
- Study on Image Training for Urban Rehabilitation and Reconstruction Planning as Preparation for Social Recovery
- Study on Advanced Community Governance through Practical Approach to support affected fishermen villages by Great East Earthquake Disaster
- Development and implementation of Geographic Disaster Management Mash-up Service (GDMS)
- Investigation on emergency response during the Chao Phraya River flood in Thailand
- Disaster information dissemination for diverse communities including foreigners during disasters
- Investigation on the use of social media during disasters
- Development of disaster information dissemination system for local community in rural mountainous area in Asia
- Investigation on the introduction of housing water tanks to store rainwater for improving urban environment and disaster risk reduction
- Development of SCM Model of University in Preparation for Emergency
- A Study on Trend Analysis on Research Field and efficient research system for disaster mitigation
- Field research on disaster response of municipal government at southern area of Kii Peninsula after flood and sediment disaster by Typhoon Talas

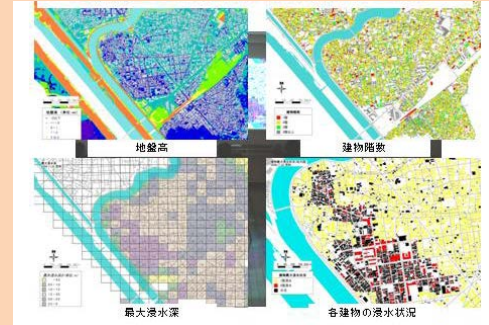


A workshop on disaster information dissemination in agricultural and mountainous area in the northeastern part of Thailand

Projects



Development of 3D Flood Viewer for Better Image of Evacuation during Large-scale Metropolitan Flood



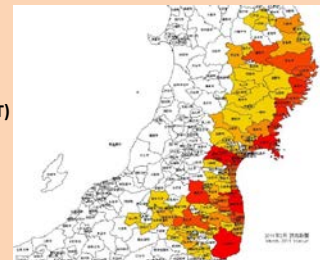
Analysis on Urban Strategy for Flood Resistant and Resilience

Grant-Aid for Scientific Research

- Policy analysis for the system of crisis-management as accident and disaster measures
- Study on Vulnerability Management in Area of Poverty in Asian Mega Cities under Climate Changing

Research Promotion Fund

- Project for mitigation of metropolitan earthquake disaster: Study on widespread crisis management and establishment of disaster mitigation (MEXT)
- Feasibility study for development of the technologies to evaluate the disaster situation by the various sensing information technologies (Research Organization of Information and Systems)
- Study on Utilization of Flood Hazard Information in Urban plan and Method of Urban Planning for Reduction of Flood Risk (Ministry of Land, Infrastructure and Transportation)
- Local Community-based Activities for Disaster Prevention to Empower Local Communities and Grow Sustainability (Fire and Disaster Management Agency of Ministry of Internal Affairs and Communications)
- Design of Disaster and Environmental Information Archive and Development of Education Program (Collaborative Research with Nagoya university funded by MEXT)
 - Study on Institution of Promotion for a Fire-Proof and Earthquake-Proof City (Sumida Ward of Tokyo Metropolitan)
 - Study Evacuation Planning in Case of Large Scale Flood (Katsushika Ward of Tokyo Metropolitan)
 - Study on Geographic Disaster Management Mash-up Service (GDMS) (Collaborative Research with JR East Consultants Company funded by MEXT)
 - Designing a disaster information dissemination system for local community in rural mountainous area in Asia (JST)



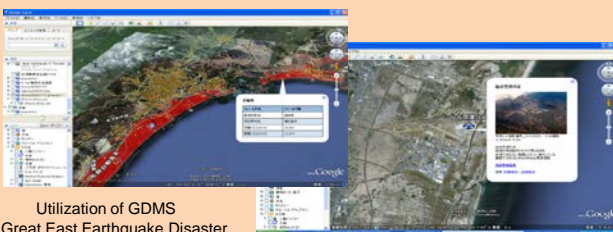
Development of Mass-media model for disaster information

Others

- Fundamental research for the development of the disaster management system based on the temporal-spatial disaster process model (GCOE)
- Development of data-archives of the responses during the Tohoku earthquake for development of the temporal-spatial disaster process model (GCOE)
- Study on Large and Wide Scale Evacuation in Case of Large Scale Flooding (Foundation of River & Basin Integrated Communications)
- Water Resources Management in the Mekong River Basin: Cooperation and Conflict at Basin and Sub-Basin Levels (Spain Government, Casa Asia research grant)
- A consideration of a suitable water resources management boundary for climate change adaptation in international river basins (Sumitomo Foundation)



Development of New Tsunami Disaster Mitigation System



Utilization of GDMS in Great East Earthquake Disaster



Local Community Collaborative Activities Adaptable for Climate Change

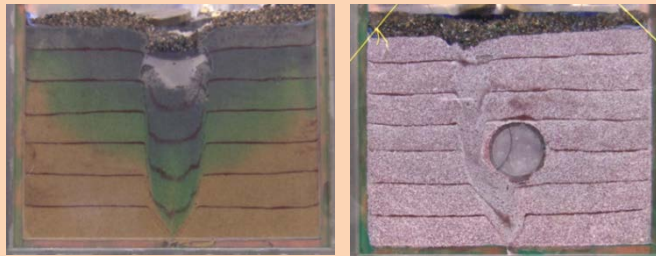
Social Infrastructure Management Division

Research themes

- Formation and evaluation of sustainable construction materials based on social perspectives
- Development of low cost and ecological repair method for RC structures damaged by fire
- Study on lifecycle management for civil infrastructure
- Effects of underground structure on the formation and expansion of subsurface cavity
- Evaluation of long-term behaviour of earth structure
- Effects of internal erosion on the stability of earth structure
- Development of sensors for the evaluation of dynamic properties of un-cemented soil
- Assessment of performance degradation of deteriorated infrastructure
- Anchorage Performance of RC structures
- Mechanics of Fiber Reinforced Concrete under Principal Stress Rotation
- Effective Press-in Driving Method
- Infrastructure Management for Aging Society



Chloride-induced deterioration of a structural concrete member



Model test simulating internal erosion around a buried structure



Assessment of Coastal Structures

Projects

Grant-in-Aid for Scientific Research

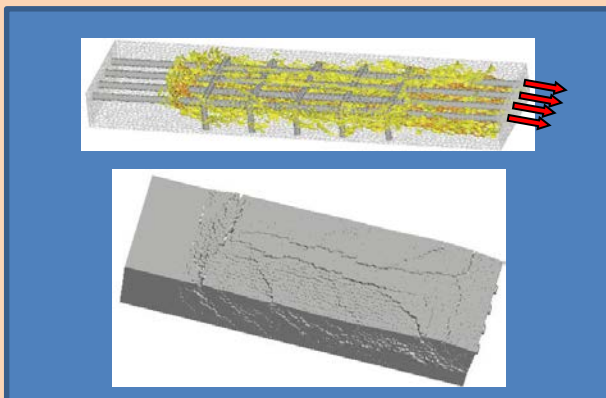
- Rational management of old earth structure with the evaluation of its soundness
 - Development of robust fiber reinforced cementitious composites under multi-directional stress condition
- Paradigm shift of design code of detailing of RC structures

Cooperative Researches

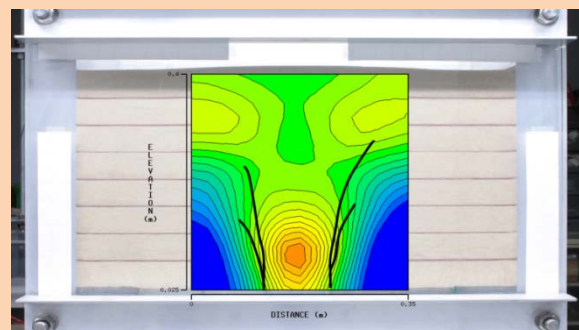
- Study on the process of loosening formation in the ground around a buried structure due to rainfall (Tokyo Gas Co.)
- Performance of mechanical anchorage system for RC structures (Shimizu Co.)
- Develop of effective pile driving method (GIKEN Co.)

Others

- Development of effective countermeasures for buried pipes against liquefaction (Ministry of Land, Infrastructure and Transportation)



Numerical simulation of RC anchorage performance by discrete analysis method

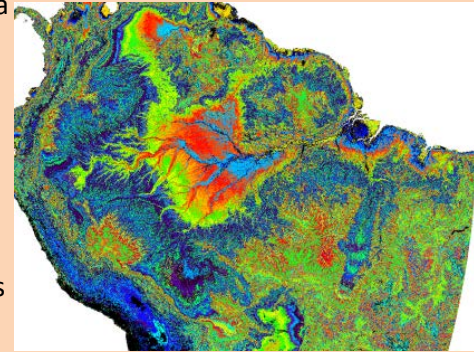


Evaluation of stress distribution using elastic wave tomography technique

Environment Informatics Division

Research themes

- Land cover mapping of Cambodia in 2010 based on remote sensing data
- Development of a site environment map of Amazon Basin
- Development of the automatic flood monitoring system for the Indo-China peninsular
- Mapping of tsunami affected area using remote sensing data
- Development of a vector based delineation method of tree crown using LiDAR data
- Analysis of documents on disaster issues by natural language processing
- Analysis of documents on environmental issues by natural language processing
- Seismic evaluation of wooden houses in preserved historic districts
- Damage survey of wooden houses caused by 2011 Great East Japan Earthquake and Tsunami
- Research on efficient utilization of road space
- Multi-Objective Assessment and Optimization of Highway Monitoring System
- Evaluation of Coordination Effect on the Drivers Behavior in Signal Change Intervals
- Trip-Chain Estimation for Network Traffic Simulation considering Electric Vehicles
- Evaluation of Traffic Management in Disaster using Traffic Simulation



The site environment map



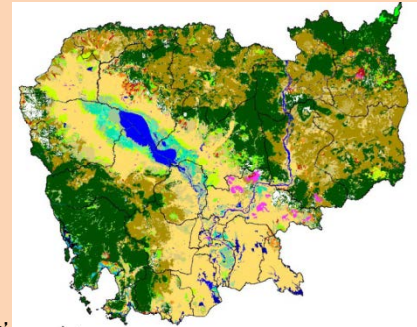
Damage survey of wooden houses caused by the 2011 Great East Japan Earthquake and Tsunami



Seismic evaluation of wooden houses in preserved historic districts



Technical tradition for wooden bridge 'Kintai-kyo'



Land cover map of Cambodia in 2010 based on MODIS data

Projects

Research Promotion Fund

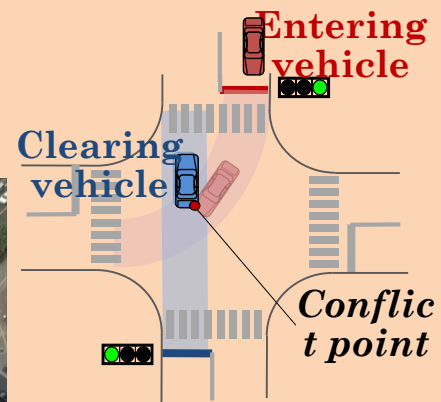
- Carbon dynamics of Amazonian forest(CADAF), JICA-JST
- Development of quantitative assessment and simulation model of forest dynamics in tropical Asia(MAFF)
- A secular change monitoring of wooden bridge "KINTAI-KYO"(Iwakuni City, Yamaguchi Prefecture)
- Technical tradition for wooden bridge "KINTAI-KYO" (Iwakuni City, Yamaguchi Prefecture)
- Evaluation Enhancement of Traffic Measures using Road Geographical Information Map (National Institute of Land and Infrastructure Management)
- Energy ITS project: Establishment of internationally reliable effect evaluation method (New Energy and Industry Technology Development Organization)

Cooperative Researches

- Development of a wave form simulator of satellite laser scanner (JAXA)
- Biomass mapping of Amazon forest (JAXA)
- Study on biomass estimation using TerraSAR-X (Pasco Ltd.)
- Research on advanced mobility (Panasonic System Networks Co., Ltd.)
- Evaluation of intergreen considering platoon in signal control coordination (Sumitomo Electric Industries Ltd.)



Simulation of traffic situation in disaster



Driving Behavior Analysis at Signal Change Intervals



Projects

- Community under fire threat: assessment of community fire hazard vulnerability of ward 65 in Dhaka City
- Applicability of H/V microtremor technique for site response analysis in Dhaka City
- Estimation of shear wave velocity using 3D microtremor measurement in Sylhet City
- Strong motion recordings during September 18, 2011 Sikkim earthquake
- Application of non-destructive testing techniques for structural safety evaluation in Bangladesh
- Vulnerability evaluation for Zindabazar government primary school, Sylhet, Bangladesh
- Geophysical investigation at Meghna Dhonagoda irrigation project(MDIP) using ground penetrating radar method

Workshops

- Training program on 'Engineers on Earthquake Safe Construction' on December 29-31, 2011
- Training program on 'Architect and Engineers on Earthquake Safe Construction' on January 12-13, 2012
- Training program on 'Masons Bar Binders on Earthquake Safe Construction' on December, January and February, 2012

Publication

- BNUS annual report— 2011

Projects / Seminars

- GIS for Irrigation Planning, FAO capacity development course "GIS and Remote Sensing in Irrigation Planning" for Afghan delegates, AIT, June 27-30, 2011.
- Introduction to GIS for Watershed Management, UNESCAP capacity development course "Integrated Watershed Management and Reforestation" for DPRK delegates, AIT, June 6th, 2011 .
- 4rd International Joint Student Seminar on Civil Infrastructure on August 1-2, 2011 at AIT

Research activities

- Investigation on emergency response activities by Thai government during the Chao Phraya River flood in Thailand
- Conducting online and ground questionnaire survey to citizens in Thailand for investigating disaster information dissemination for diverse communities including foreigners the Chao Phraya River flood in Thailand
- Organizing village workshop and interviewing local government officers for developing disaster information dissemination system in rural and agricultural area in the northeastern part of Thailand

Publications

- 4rd Joint Student Seminar on Civil Infrastructure
- Workshop on Disaster information dissemination system for local community in rural mountainous area: part1 January 23-26 2011

Memorandum of Understandings

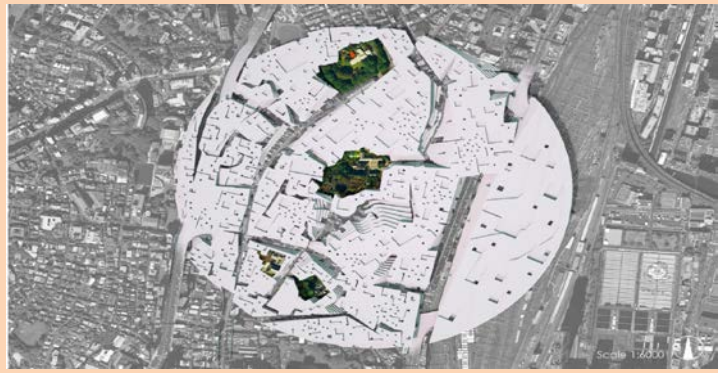


- School of Applied Sciences and Engineering, Monash University, Gippsland Campus (Australia)
- National Centre for Earthquake Engineering (Bangladesh)
- Bangladesh Earthquake Society (Bangladesh)
- BNUS, Dept of Civil Engineering, Bangladesh University of Engineering and Technology (Bangladesh)
- Indian Institute of Technology, Kanpur (India)
- Dept. of Civil Engineering, Shibaura Institute of Technology (Japan)
- LCM Research Center, The Port and Airport Research Institute (Japan)
- Global U-City Construction & Information, Hub Dept. of Civil Engineering, Han Yang University (Korea)
- NIDP, National Emergency Management Agency, Seoul, Korea (Korea)
- NSET, the National Society for Earthquake Technology-Nepal (Nepal)
- Center for Public Safety Research, Tsinghua University (P.R.China)
- Protective Technology Research Centre, Nanyang Technological University (Singapore)
- Dept. of Civil Engineering, National University of Singapore (Singapore)
- Sirindhorn International Institute of Technology, Thammasat University (Thailand)
- RNUS, Asian Institute of Technology (Thailand)

ICUS Project

Proposal of innovative safety cities

- 3-Dimensional middle rised high density dwelling model for urban block 「500mR」
- Research on high-dense wooden structure city



Research Publications

	Urban Safety & Disaster Mitigation Division	Social Infrastructure Management Division	Environment Informatics Division
IIS Bi-monthly Research Report	25	9	10
Books/Translated Books	12	1	1
Reviewed Papers/Journal Papers	23	15	6
Conference Papers (International)	21	13	19
Conference Papers (Domestic)	37	19	23
Survey Reports	8	0	3
Others	46	10	26
Total	172	67	88

Publications

ICUS News Letter

Volume 10, 4, Volume 11,1-3

ICUS Report 2011/01-07

- 01: 19th ICUS Open Lecture
- 02: 2011 New Technologies for Urban Safety of Mega Cities in Asia
- 03: 4th Joint student seminar on civil infrastructures August 1-2, 2011
- 04: ICUS ACITIVITI REPORT Summarizing the Activities of 2009 & 2010
- 05: BNUS ANNUAL REPORT-2011
- 06: Workshop on Disaster information dissemination system for local community in rural mountainous area: part 1
- 07: ICUS 東日本大震災関連記録集 (1) 2012.03”

Annual report

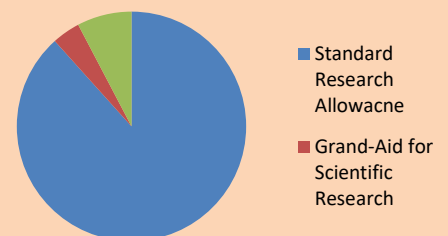
Activities Recognized

Hiroki Shimono	May	Best Paper Award	Institute of Social Safety Science	Meguro Lab.
Makoto Fujii	Jun.	Outstanding Poster Presentation	Eastern Asia Society for Transportation Studies(EASTS)	Ohara Lab.
Rajendra SOTI	Aug.	Best Presentation Award	The 4 th Joint Student Seminar on Civil Infrastructure	Meguro Lab.
Rajendra SOIT	Aug.	Best Presentation Award	Japan Society of Civil Engineers	Meguro Lab.
Tomoko Matsushita	Oct.	Best Poster Presentation Award	USMCA2011	Meguro Lab.
Hirotohi Kishi	Oct.	Best Presentation Award	USMCA2011	Takeuchi Lab.
Sho Oh	Oct.	Best Presentation Award	USMCA2011	Kuwano Lab.

Graduated students

	Urban Safety & Disaster Mitigation Division	Social Infrastructure Management Division	Environment Informatics Division
graduated	3	2	0
Master graduated	5	1	5
Doctor graduated	1	0	3
Total	9	3	8

Budget



International Center for Urban Safety Engineering, Institute of Industrial Science, The University of Tokyo

BW603, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8505, JAPAN

Tel: 03-5452-6472 Fax:03-5452-6476

E-mail: icus@iis.u-tokyo.ac.jp <http://icus.iis.u-tokyo.ac.jp/>



Staff Members

Urban Safety and Disaster Mitigation Division

- Prof. Kimiro MEGURO (Professor / Director)
- Prof. Yasuyoshi ICHIHASHI (Visiting Professor)
- Dr. Takaaki KATO (Associate Professor)
- Dr. Miho OHARA (Associate Professor)
- Dr. Akiyuki KAWASAKI (Project Research Associate Professor)
- Dr. Muneyoshi NUMADA (Research Associate)
- Dr. Shinya KONDO (Project Researcher)

Social Infrastructure Management Division

- Prof. Hiroshi YOKOTA (Visiting Professor)
- Dr. Reiko KUWANO (Associate Professor)
- Dr. Michael Henry (Project Researcher)

Environment Informatics Division

- Prof. Haruo SAWADA (Professor)
- Dr. Mikio KOSHIHARA (Associate Professor)
- Dr. Shinji TANAKA (Lecturer)
- Dr. Takahiro ENDO (Research Associate)

Office

- Ms. Eiko YOSHIMOTO



Research Fellow

- Dr. Reiko AMANO
- Dr. Ema KATO
- Dr. Yoshitaka KATO
- Dr. Junichi SUSAKI
- Dr. Masahiro SETOJIMA
- Dr. Satoshi TSURUDA
- Prof. Ansary Mehedi Ahmed
- Prof. Hoang Hong
- Prof. Sudhir Misra
- Dr. Dutta Dushmanta
- Prof. Tan Kiang Hwee
- Prof. Worak Kanok-Nukulchai