

# **Annual Report 2009**

**Geography**

**Department of Geography**  
**Graduate School and Faculty of Urban Environmental Sciences**  
**Tokyo Metropolitan University**

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## **1. Laboratory of Quaternary Geology and Geomorphology**

### **1) Staff**

Haruo YAMAZAKI                      Professor / D.Sc.  
Geomorphology, Quaternary Science, Seismotectonics

Takehiko SUZUKI                      Professor / D.Sc.  
Geomorphology, Quaternary Science, Volcanology

Masaaki SHIRAI                      Associate Professor / PhD (D.Sc.)  
Sedimentology, Quaternary Geology, Marine Geology

### **2) Overview of Research Activities**

We aim to study the various earth scientific phenomena and processes on the solid earth surface. Especially, main objective of our research is to prospect the futuristic view of environmental changes through the understanding the history and process of surface geology/landform development during the Quaternary period. The followings are some examples of our studies.

- 1) Plate tectonics: The Quaternary tectonics including the historical process of seismic and volcanic activity are our special interest along the plate collision zone.
- 2) Tephra study: Tephra means a generic term on the volcanic ejecta excluding lava-flow and related explosive deposits. We are trying to identify the source volcano, age of the eruption and the distribution of widespread tephra that have covered the Japanese Islands through the Pliocene, Pleistocene and Holocene.
- 3) Paleo-environment and natural hazards: On the basis of geomorphological and sedimentological studies, paleo-environmental change and natural hazards history are reconstructed.
- 4) Chronological studies: We are improving chronological efficiency of tephro-stratigraphy, radio-isotope activity, historical records, and so on through studies on these objectives.
- 5) Modeling: For understanding correlation between intra-surface processes (volcanism, faulting etc.) and land formation, studies on computer simulation are carried out.

### **3) List of Research Activities in FY2009**

### ***Peer-reviewed Articles***

- Ishikawa, S., Suzuki, T., Nakayama, T., and Kashima, K. 2009. Reconstruction of the Holocene Environments in the Tokyo Lowland, inferred from diatom assemblages. *Journal of Geography (Japan)* **118**: 245-260. (in Japanese with English abstract)
- Shirai, M., Omura, A., Wakabayashi, T., Uchida, J., and Ogami, T. 2010. Depositional age and triggering event of turbidites in the western Kumano Trough, central Japan during the last ca. 100 years. *Marine Geology* **271**: 225-235, doi: 10.1016/j.margeo.2010.02.015.
- Oishi, M. 2010. An attempt at correlation of tephra using a refractive index of plagioclase phenocrysts. *The Quaternary Research* **49**: 35-42. (in Japanese with English abstract)
- Oishi, M. 2010. Estimation of source craters of Kawakami tephra of Yatsugatake Younger Tephra Beds, using refractive index of phenocryst crystals. *Journal of Geography (Japan)* **119**: 33-45. (in Japanese with English abstract)
- Tamura, I., and Yamazaki, H. 2010. Significance of the remarkable unconformity in the Plio-Pleistocene of the Japanese Islands. *Quaternary International*, doi:10.1016/j.quaint.2010.01.013.
- Muragishi, J. 2009. Coseismic and postseismic coastal environment changes caused by the 1703 Genroku Kanto Earthquake in the southern part of Boso Peninsula, central Japan. *Historical Earthquakes* **24**: 129-143. (in Japanese with English abstract)

### ***Other Articles***

- Yamazaki, H. 2010. 19 Rias coast: Snapshot of the interglacial stage. In *Satellite View of the Earth Topography: Japan and World*, ed. T. Kato, Y. Yamaguchi, H. Watanabe, H. Yamazaki, Y. Shiokawa, and M. Komoda, Tokyo: Asakura-Shoten, 80-83. (in Japanese)
- Yamazaki, H. 2010. Understanding and interpretation of landforms. In *Satellite View of the Earth Topography: Japan and World*, ed. T. Kato, Y. Yamaguchi, H. Watanabe, H. Yamazaki, Y. Shiokawa, and M. Komoda, Tokyo: Asakura-Shoten, 117-135. (in Japanese)
- Suzuki, T. 2009. Stratigraphy and chronology in Quaternary. In *Digital Book: Progress in Quaternary Research in Japan*, ed. Japan Association for Quaternary Research, Tokyo: Japan Association for Quaternary Research. (in Japanese)
- Suzuki, T. 2009. Tephra and tephrochronology. In *Digital Book: Progress in Quaternary Research in Japan*, ed. Japan Association for Quaternary Research, Tokyo: Japan Association for Quaternary

Research. (in Japanese)

- Oishi, M. 2009. Description of characteristics of volcanic products and distribution of tephra from Azumaya Volcano, central Japan. *Journal of Geography (Japan)* **118**: 1237-1246. (in Japanese with English abstract)
- Ueki, T., Yamaguchi, M., Hongo, M., Naya, T., and Mizuno K. 2009. Paleomagnetic and rock-magnetic measurements for the GS-SB-1 core at Shobu Town, central Kanto Plain, Japan. *Journal of the Geological Survey of Japan* **60**: 199-243. (in Japanese with English abstract)
- Ueki, T., and Kondo, R. 2009. Magnetostratigraphy of the Upper Miocene Oshidomari Formation in the Rishiri Island, off north Hokkaido, Japan. *Rishiri Studies* **28**: 1-10. (in Japanese with English abstract)
- Kondo, R., and Ueki, T. 2009. Lithofacies of borehole core RO-1 in Numaura Maar, Rishiri Island, Hokkaido. *Rishiri Studies* **28**: 45-49. (in Japanese with English abstract)
- Tamura, I. 2010. The report of the Science Partnership Project (PlanA- AG093164): History of global environment learnt from accessible landscape. *Tokyo Metropolitan Wakaba Synthesis High School Research Bulletin in 2009* **5**: 62-68. (in Japanese)
- Kawamura, N., Kodama, H., Takeda, Y., Tamura, I., Naiki, A., Negishi, K., and Hirano, H. 2009. *Interpretation of High School Education Ministry Guidelines, Science, Science and Mathematics*. Chapter 2 Each subject, Paragraph 8 Base of geology, and Paragraph 9 Geology. The Ministry of Education, Culture, Sports, Science and Technology, 95-117. (in Japanese)
- Muragishi, J. 2010. The damage, environmental changes and social influences caused by the 1707 Hiei Earthquake in the Atsumi Peninsula, central Japan. *Geographical Reports of Tokyo Metropolitan University* **45**: 1-10.

### **Books**

- Kato, H., Yamaguchi, Y., Watanabe, H., Yamazaki, H., Shiokawa, Y., and Komoda, A. eds. 2010. *Satellite View of the Earth Topography: Japan and World*. Tokyo: Asakura-Shoten. (in Japanese)

### **Reports**

- Yamazaki, H., Suzuki, T., Tamura, I., and Oishi, M. 2010. Upgrade studies on the analysis of volcanic materials for the safety of nuclear power facilities. *Report of the 2009-2010 Funded Research of Japan Nuclear Energy Safety Organization (JNES)*, Tokyo Metropolitan University. (in Japanese)

### ***Book Reviews***

- Yamazaki, H. 2009. Book review (Kamata, H. Trigger Points of the Earth Science). *The Quaternary Research* **48**: 427-428. (in Japanese)
- Tamura, I. 2009. Book review (Aoki, M., Mokudai, K., and Sawada, Y. Field Picture Book to Understand Geographical Features). *The Education of Geology* **62**: 202-203. (in Japanese)

### ***Presentations***

- Yamazaki, H., and Suzuki, T. 2009. Landscape and environmental change caused by landform development in Tokyo. Meguro City College “Environmental Change and History”, June, Setagaya. (in Japanese)
- Yamazaki, H. 2009. Seismic hazard in Kanagawa Prefecture. Lecture of the Super Science High-school Project at Seisho High-school, Kanagawa Prefecture, April, Odawara. (in Japanese)
- Yamazaki, H. 2009. Origin of Musashino upland and its tephro-stratigraphy. Lecture of the Science Partnership Project of the Tokorozawa High-school, May, Tokorozawa. (in Japanese)
- Yamazaki, H. 2009. Prediction of natural hazards using the interpretation of landform development. Lecture at the Tokyo Disaster Prevention Exhibition, August, Shinjuku. (in Japanese)
- Yamazaki, H. 2009. Environmental and human history changes caused by earthquakes. Meguro City Collage “Environmental Change and History”, October, Meguro. (in Japanese)
- Yamazaki, H. 2009. Profit and problem on utilization of geological information (bore material) : From user’s viewpoint. 8th Discussion of Geoinformation Consocium Japan, October, Tokyo. (in Japanese)
- Yamazaki, H. 2009. Global environment deduced from the various landscape feature. Lectures of the Science Partnership Project of the Wakaba Sogo High-school, October and November, Inagi. (in Japanese)
- Suzuki, T. 2009. Environmental change caused by landform development. Meguro City College “Environmental Change and History”, May, Meguro. (in Japanese)
- Suzuki, T. 2009. Tachikawa Fault and Sayama Hills. Asahi Culture Center Tachikawa, May, Tachikawa. (in Japanese)
- Suzuki, T. 2009. Developing a Quaternary tephrochronological framework for Kanto in central Japan: Stratigraphy, chronology and geological structure of Kazusa Group. The 3rd Annual Meeting of the Kanto Branch, Geological Society of Japan, Geology in the Kanto District:

- Progress and Problems of Research, June, Shinjuku. (in Japanese)
- Suzuki, T. 2009. Natural history and disaster of Edo and Tokyo. Kogakuin University and Asahi College, June, Shinjuku. (in Japanese)
- Suzuki, T. 2009. Observation of Kd-38, Byobugaura, Chiba Prefecture. Science Partnership Project at Mita Senior High School: Quest for Super Volcano, July, Choshi. (in Japanese)
- Suzuki, T., Koarai, M., and Nakayama, D. 2009. Construction of tephra database on GIS. Workshop: Tephra Studies in Japan for Active Tephra 2010 in Kyushu, July, Hachioji. (in Japanese)
- Suzuki, T. 2009. Fieldwork: Activities of Fuji and Hakone volcanoes and observation of their products. Science Partnership Project at Tokorozawa Senior High School: Activities of Fuji and Hakone volcanoes and development of Musashino uplands constructed by tephrostratigraphy, July, Gotenba and Hakone. (in Japanese)
- Suzuki, T., and Obara, M. 2009. Underground tephtras and geological structure of Quaternary Kazusa Group around Machida in Tama Hills, central Japan. Japan Association for Quaternary Research, Programme and Abstracts, **39**: 34-35. August, Kusatsu(Shiga). (in Japanese)
- Suzuki, T. 2009. Environmental change and history caused by volcanic activity. Meguro City College “Environmental Change and History”, September, Meguro. (in Japanese)
- Suzuki, T. 2009. Nature and history of Kanto Plain. Kogakuin University and Asahi College, September, Shinjuku. (in Japanese)
- Suzuki, T. 2009. Geological survey by boring core and underground tephtras in Tokyo metropolitan area, central Japan. JST Innovation Bridge, Tokyo Metropolitan University, Research Seeds Conference 2009, September, Akihabara. (in Japanese)
- Suzuki, T. 2009. Measurement of refractive index of volcanic glass. Science Partnership Project at Mita Senior High School: Quest for Super Volcano, September, Hachioji. (in Japanese)
- Suzuki, T. 2009. Tephtras in Kazusa Group, Tama Hills. Tokyo Geotechnical Consultant Association Seminar, October, Tachikawa, Hachioji and Inagi. (in Japanese)
- Suzuki, T. 2009. Tama and Musashino: History of Tama by reading maps. Asahi Culture Center Tachikawa, October, Tachikawa. (in Japanese)
- Suzuki, T. 2009. Environmental change and history caused by landform changes. Meguro City College “Environmental Change and History”, November, Meguro. (in Japanese)
- Suzuki, T. 2009. History of palaeoenvironment change by reading landscapes and maps. Kogakuin University and Asahi College, November, Shinjuku. (in Japanese)

- Suzuki, T. 2010. Landforms and history of Tokyo through the reading of topographical map. Kogakuin University and Asahi College, February, Shinjuku. (in Japanese)
- Suzuki, T., and Kondo, R. 2010. Visit to origin of Hakone-TAu-11. Excursion in Oiso Hills of the Science Partnership Project of Mito First Senior High School: Quest for Underground Geology around the Mito First Senior High School by Boring, February, Kanagawa. (in Japanese)
- Suzuki, T. 2010. Map reading: How to read topographical map, and fundamental of landform and geology. Lecture for Green Volunteer Leader by Bureau of Environment, Tokyo Metropolitan Government, February, Shinjuku. (in Japanese)
- Suzuki, T., Obara, M., Murata, M., Kawashima, S., and Kawai, M. 2010. Quaternary crustal movement around the Tama Hills deduced from three boring cores, in Inagi and Machida Cities, Kanto, Central Japan. Proceedings of the General Meeting of the Association of Japanese Geographers 2010 Spring Meeting **77**: 133, March, Tokyo. (in Japanese)
- Ishiyama, T., Sato, H., Imaizumi, T., Suzuki, T., Toda, S., Echigo, T., Koike, T., and Kamataki, T. 2009. High resolution seismic reflection profiling and borehole drillings across the Kakudayama thrust, central Japan. Abstracts of Japan Geoscience Union Meeting 2009: J245-P012 (CD-ROM), May, Makuhari. (in Japanese with English abstract)
- Koarai, M., Suzuki, T., Nakayama, D., Wachi, T., and Fujinawa, A. 2009. Estimation of tephra hazard using tephra GIS. Abstracts of Japan Geoscience Union Meeting 2009: X165-003 (CD-ROM), May, Makuhari. (in Japanese with English abstract)
- Okumura, K., Sato, T., Kumai, H., Suzuki, T., and Watanabe, M. 2009. New definition and status of the Quaternary System/Period. Japan Association for Quaternary Research, Programme and Abstracts **39**: 56-57, August, Kusatsu (Shiga). (in Japanese)
- Toyoda, S., Asagoe, M., Tissoux, H., Falguères, C., and Suzuki, T. 2009. High precision ESR dating of quartz of tephra by regeneration method. Japan Association for Quaternary Research, Programme and Abstracts **39**: 136-137, August, Kusatsu (Shiga). (in Japanese)
- Makino, Y., Ito, T., and Suzuki, T. 2009. Field work: Observation of landform and geology in uplands and along the coast around Mito City. Science Partnership Project of Mito First Senior High School: Quest for Underground Geology around the Mito First Senior High School by Boring, December, Ibaraki. (in Japanese)
- Miyajima, S., Yamane, M., Suzuki, M., Suzuki, T., and Ueki, T. 2010. A visit at the wonderful outcrop of sedimentary rocks in the Choshi district. Science Partnership Project: Let's Study Geoscience with the Touching Wonderful Exposure, February, Choshi. (in Japanese)



- Shiai, M. 2009. Sand grain transport from land to deep marine revealed by OSL. Special Symposium of Turbidite, April, Tsukuba. (in Japanese)
- Shirai, M., Omura, A., Ito, T., Nagumo, N., Kawamura, K., Oishi, M., Wakabayashi, T., Niwa, Y., and Kameo, K. 2009. Core samples obtained from off the Enshu Coast: Preliminary report of R/V Tansei-maru KT-08-30 cruise (Part 1). Abstracts of Japan Geoscience Union Meeting 2009: G121-P008 (CD-ROM), May, Makuhari. (in Japanese with English abstract)
- Shirai, M., Wakabayashi, T., Omura, A., Nagumo, N., Niwa, Y., and Oishi, M. A seismogenic turbidite formed by the Ansei-Tokai Earthquake in Edo Era obtained from surface core sample in the Enshu Trough. Abstracts of Japan Geoscience Union Meeting 2009: Q145-009 (CD-ROM), May, Makuhari. (in Japanese with English abstract)
- Shirai, M., Omura, A., Wakabayashi, T., and Ogami, T. 2009. Relict of modern natural hazards obtained from forearc basin off the Tonankai district. Japan Association for Quaternary Research, Programme and Abstracts **39**: 20-21, August, Kusatsu (Shiga). (in Japanese)
- Shirai, M. 2010. Relict of modern natural disasters obtained from 2000m deep sea floor off the Kii Peninsula. The 138th Meeting of Shonan-Chikyukagaku, January, Sagamihara. (in Japanese)
- Shirai, M., Hayashizaki, R., Liu, H., and Sato, S. 2010. Coastal erosion at the Yonetsu-no-Hama beach of western Enshu Coast and decrease in bleaching percentage (BLP). Program and Abstracts of Annual Meeting of the Sedimentological Society of Japan, 2010: 10-11, March, Mito. (in Japanese)
- Izumitani, N., Sagawa, T., Murayama, M., Asahi, H., Kitazato, H., Nakamura, Y., Shirai, M., Ashi, J., and Tokuyama, H. 2009. Chronology and sedimentation of hyper salinity lake (Meedee lake) in the eastern Mediterranean. Abstracts of Japan Geoscience Union Meeting 2009: L135-012 (CD-ROM), May, Makuhari. (in Japanese with English abstract)
- Omura, A., Shirai, M., Ito, T., Wakabayashi, T., Oishi, M., Kawamura, K., Nagumo, N., Niwa, Y., and Kameo, K. 2009. Surface sediments of deep-sea basin floor from the Kumano Trough: Preliminary report of R/V Tansei-maru KT-08-30 cruise (Part 2). Abstracts of Japan Geoscience Union Meeting 2009: G121-P009 (CD-ROM), May, Makuhari. (in Japanese with English abstract)
- Oishi, M. 2009. Description and correlation of the products from the Azumaya volcano, central Japan. Proceedings of the 3rd Annual Meeting of the Kanto Branch, Geological Society of Japan: 50-53, June, Tokyo. (in Japanese)
- Oishi, M., and Geshi, N. 2009. Classification of Shirakawa pyroclastic flow deposit distributed

- around south flank of Haruna volcano, central Japan, based on the characteristics of plagioclase phenocryst. Japan Association for Quaternary Research, Programme and Abstracts **39**: 132-133, August, Kusatsu (Shiga). (in Japanese)
- Oishi, M. 2010. Significance of study about Ohtsukigawa debris avalanche on Yatsugatake volcano at 9th century. The 138th Meeting of Shonan-Chikyukagaku, January, Sagamihara. (in Japanese)
- Oikawa, T., Geshi, N., Hoshizumi, H., Onizawa, S., Oishi, M., Tamura, I., Furukawa, R., Itoh, J., Miyagi, I., Ishizuka, Y., and Hayashizaki, R. 2009. Preliminary report on ash-fall during the February 2, 2009 eruption of Asama Volcano. Abstracts of Japan Geoscience Union Meeting 2009: V159-P035 (CD-ROM), May, Makuhari. (in Japanese with English abstract)
- Ueki, T., Suzuki, T., Geshi, N., and Aoki, H. 2009. Magnetostratigraphy of the Shirakawa pyroclastic flow deposits, south Northeast Japan. Abstracts of Japan Geoscience Union Meeting 2009: Q145-002 (CD-ROM), May, Makuhari. (in Japanese with English abstract)
- Tamura, I., and Yamazaki, H. 2009. The age of the lower Kazusa Group by the Pliocene tephra correlation in the Namihana and Katsuura Formation in the Boso Peninsula. Abstracts of Japan Geoscience Union Meeting 2009: Q145-001(CD-ROM), May, Makuhari. (in Japanese with English abstract)
- Tamura, I., and Yamazaki, H. 2009. The tephra stratigraphy and correlation of all drilling core from the Kawasaki micro-earthquake observation well, Kanagawa Prefecture, Japan. Japan Association for Quaternary Research, Programme and Abstracts **39**: 30-31, August, Kusatsu (Shiga). (in Japanese)
- Tamura, I., Okada, M., and Yamazaki, H. 2009. The Plo-pleistocene tephra stratigraphy and correlation of the Chikura Group distributed in the Boso area, central Japan. Abstracts of Geological Society of Japan 2009 Meeting: 72, September, Okayama. (in Japanese)
- Shoda, K., Taura, I., Earth Science Club and students taking the earth science in Tokorozawa Senior High School 2009. Topography and geology of the Musashino Plateau and the Sayama Hill spreading around Tokorozawa Senior High School. Abstracts for 2009 Annual Meeting of the Association for Geological Collaboration in Japan: 89, August, Shimonita (Gunma). (in Japanese)
- Ando, K., and Yamazaki, H. 2009. Generation condition and mechanism of faults flexure—Example of Tachikawa fault—. Abstracts of Japan Geoscience Union Meeting 2009: S147-008 (CD-ROM), May, Makuhari. (in Japanese with English abstract)
- Ando, K., and Yamazaki, H. 2009. Generation condition and mechanism of faults flexure—Using

- numerical simulation—. Japan Association for Quaternary Research, Programme and Abstracts **39**: 4-5, August, Kusatsu (Shiga). (in Japanese)
- Ando, K., and Yamazaki, H. 2009. Elucidation for fault flexure and fault parameter by computer simulation. Abstracts of the Seismological Society of Japan 2009 Fall Meeting: 140, October, Kyoto. (in Japanese)
- Muragishi, J., and Yamazaki, H. 2009. Post earthquake coastal changes in southern part of Boso Peninsula due to the 1703 Genroku Kanto Earthquake. Japan Association for Quaternary Research, Programme and Abstracts **39**: 94-95, August, Kusatsu (Shiga). (in Japanese)
- Muragishi, J. 2009. The social effect of the long-term coastal environment changes after the 1703 Genroku Kanto Earthquake in the southern part of Boso Peninsula. The 26th Annual Meeting of the Society of Historical Earthquake Studies, September, Otsu. (in Japanese)
- Murata, M., and Suzuki, T. 2009. Geological structure of the southeast part of the Musasino uplands deduced by Miyata Tuff sandwiched in Wadabori Core obtained in Suginami Ward, Tokyo. Workshop: Tephra Studies in Japan for Active Tephra 2010 in Kyushu, July, Hachioji. (in Japanese)
- Murata, M., and Suzuki, T. 2009. Re-examination on correlation of early Pleistocene tephtras in the Obama Formation of Inubo Group at Byobugaura in Choshi area and Shirakawa Pyroclastic Flow Deposit Group, Northeast Japan. Japan Association for Quaternary Research, Programme and Abstracts **39**: 130-131, August, Kusatsu (Shiga). (in Japanese)
- Kuriyama, Y. 2009. Fluvial terrace and sediment of the Tsugawa basin—Tephra from Numazawa Volcano and Sunagohara Volcano and their impact—. Workshop: Tephra Studies in Japan for Active Tephra 2010 in Kyushu, July, Hachioji. (in Japanese)
- Hayashizaki, R. 2009. The relation between fluvial terrace formation and crustal movement in the Hamadori Region, Fukushima Prefecture, Northeast Japan. Japan Association for Quaternary Research, Programme and Abstracts **39**: 90-91, August, Kusatsu (Shiga). (in Japanese)
- Kasahara, A. 2010. Fluvial terraces along the Akiyama and the Sawai Rivers, in the tributaries of the upper Sagami River basin, Central Japan. The Seminar of Researches in Sagamihara City Museum, March, Sagamihara. (in Japanese)
- Nakamura, Y. 2010. Geological survey on gravel sediments in the Kikukawa River of the Oiso Hills. Colloquium of Cold Region Geomorphology, February, Tokyo. (in Japanese)
- Hayashi, M. 2010. Influence of volcanic activities over geomorphic development along the Karasu River, southwest foot of Haruna Volcano, North Kanto, Central Japan. Meeting of Geographical

Graduation Thesis 2010, March, Koganei. (in Japanese)

## 2. Laboratory of Climatology

### 1) Staff

Jun MATSUMOTO                      Professor / D. Sc  
Monsoon Climatology

Hideo TAKAHASHI                      Professor / D.Sc.  
Urban Climatology

Hiroshi TAKAHASHI                      Assistant Professor / PhD (D.Sc.)  
Asian Monsoon, Cloud-Precipitation Climatology, Regional Climate Modelling

### 2) Overview of Research Activities

Our laboratory investigates climate system on the earth in various temporal-spatial scales. In particular, we focus on climate changes due both to natural and anthropogenic causes, for example, processes of heat island and heavy rainfall events over and around urban regions, and influences of land-use changes and deforestation on regional climates. We also investigate diurnal, intra-seasonal, and inter-annual variabilities and long-term changes of climate, in particular, rainfall activities in the Asian monsoon region, and influences of global warming on regional climates (future projection).

We apply three major methods, observation (monitoring), data-analysis of various global and regional datasets, and numerical modeling for investigating above-mentioned topics.

- 1) Climate changes and climate variability over Japan and around the world
- 2) Variability and seasonal changes of regional climate over Asian monsoon region
- 3) Observational study on formation processes of urban heat island, detailed structure of urban boundary layer, and elucidation of urban effects on short duration intense rainfall
- 4) Impacts of land-surface conditions and changes on cloud and precipitation activities, in particular, in the tropics
- 5) Reconstruction of past climate during the historical period in Japan and in East Asia

### 3) List of Research Activities in FY2009

### ***Peer-reviewed Articles***

- Asada, H., and Matsumoto, J. 2009. Effects of rainfall variation on rice production in the Ganges – Brahmaputra Basin. *Climate Research* **38**:249-260, doi:10.3354/cr00785.
- Endo, N., Matsumoto, J., and Tun Lwin 2009. Trends in precipitation extremes over Southeast Asia. *SOLA (Scientific Online Letters on the Atmosphere)* **5**:168-171, doi:10.2151/sola.2009-043.
- Kurita, N., Ichiyanagi, K., Matsumoto, J., Yamanaka, M.D., and Ohata, T. 2009. The relationship between the isotopic content of precipitation and the precipitation amount in tropical regions. *Journal of Geochemical Exploration* **102**:113-122.
- Ogino, S. -Y., Nodzu, M.I., Tachibana, Y., Matsumoto, J., Yamanaka, M.D., and Watanabe, A. 2010. Temperature inversions over the inland Indochina revealed by GAME-T enhanced rawinsonde observations. *SOLA (Scientific Online Letters on the Atmosphere)* **6**:5-8, doi:10.2151/sola.2010-002.
- Takahashi, H. G., Fujinami, H., Yasunari, T., and Matsumoto, J. 2010. Diurnal rainfall pattern observed by TRMM-PR around the Indochina Peninsula. *Journal of Geophysical Research* **115**: doi:10.1029/2009JD012155.
- Takahashi, H. G., Yoshikane, T., Hara, M., Takata, K., and Yasunari, T. 2010. High-resolution modelling of the potential impact of land-surface conditions on regional climate over Indochina associated with the diurnal precipitation cycle. *International Journal of Climatology*, doi:10.1002/joc.2119.
- Takahashi, H. G. 2010. Seasonal changes in diurnal rainfall cycle over and around the Indochina Peninsula observed by TRMM-PR. *Advances in Geosciences* **25**:23-28.
- Oouchi, K., Noda, A. T., Satoh, M., Wang, B., Xie, S.-P., Takahashi, H. G., and Yasunari, T. 2009. Asian summer monsoon simulated by a global cloud-system-resolving model: Diurnal to intra-seasonal variability. *Geophysical Research Letters* **36**: doi:10.1029/2009GL038271.
- Hara, M., Yoshikane, T., Takahashi, H. G., Kimura, F., Noda, A., and Tokioka, T. 2009. Assessment of the diurnal cycle of precipitation over the maritime continent simulated by 20-km mesh GCM using TRMM PR data. *Journal of the Meteorological Society of Japan* **87A**:413-424.
- Okubo, S., and Takahashi, H. 2010. Analysis of long-term trend and interannual variation in SPM concentration in Japan using data from air quality monitoring stations. *Journal of Japan Society for Atmospheric Environment* **45**: 96-106. (in Japanese with English abstract)

### ***Other articles***

- Matsumoto, J., Asada, H., and Hayashi, T. 2009. Floods and cyclones in Bangladesh, In *Natural Disasters in the Age of the Global Warming: Six Field Reports from around the World*, ed. Commission on Disaster Responses of the Association of Japanese Geographers, Y. Hirai, and T. Aoki, Tokyo: Kokon-Shoin, 35-57.
- Takahashi, H. 2010. Urban and precipitation. In *Why is the Inland City Hot? : Answer from Kumagaya, the Hottest City in Japan*, ed. Y. Fukuoka, and K. Nakagawa, Tokyo: Seizando Shoten, 75-102. (in Japanese)
- Mikami, T., Narita, K., Sugawara, H., Shimizu, S., and Hagiwara, S. 2010. Cool island phenomena in the Institute for Nature Study. *Miscellaneous Reports of the National Park for Nature Study* **41**: 85-94. (in Japanese)
- Zaiki, M. 2009. Chapter 9: Reconstruction of earth environment. In *Escape from the Economy*, ed T. Oda, and J. Fukada, Yokohama: Shumpusha Publishing, 215-234. (in Japanese)
- Zaiki, M., Oguchi, T., Koike, S., Yamauchi, M., Kagawa, Y., and Esaki, Y. 2009. Time series analysis of relationship between population and topography in Japan based on municipal datasets. In *Sinfonica Library "Population, Residence and Nature –GIS analysis–"*, ed. T. Oguchi, Tokyo: Statistical Information Institute for Consulting Analysis, 17-27. (in Japanese)
- Oguchi, T., Ito, F., Aoki, T., Esaki, Y., Hori, K., Zaiki, M., and Kagawa, Y. 2009. Relationship between population and topography in Japan based on prefectural datasets. In *Sinfonica Library "Population, Residence and Nature –GIS analysis–"*, ed. T. Oguchi, Tokyo: Statistical Information Institute for Consulting Analysis, 1-16. (in Japanese)
- Tanaka, H. 2010. High-altitude thermal belt observed at Mt. Yatsugatake. *Agricultural Meteorology in Tohoku* **54**: 15-17. (in Japanese)
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- Takahashi, H.G. 2010. Potential impact of deforestation on the regional climate over the Indochina Peninsula (Numerical experiment). MAHASRI/HyARC National Science Meeting, March, Tokyo. (in Japanese)
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- Zaiki, M. 2009. Global warming course "Earth's homeostasis". Kita-ku Environment College, July, Tokyo. (in Japanese)

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- Zaiki, M. 2009. The 19th century meteorological observation in Japan. Salon of Geography No.96, December, Tokyo. (in Japanese)
- Grossman, M., and Zaiki, M. 2009. Typhoons affecting Japan from 1860 to 1879. The Association of American Geographers 2009 Annual Meeting Abstracts: 259, April, Las Vegas, USA.
- Grossman, M., Zaiki, M., and Mikami, T. 2009. Reconstructing typhoons in Japan in the 19th century from documentary records. Proceedings of the General Meeting of the Association of Japanese Geographers 2009 Fall Meeting **76**: 139, October, Okinawa. (in Japanese)
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- Tanaka, H., Kobayashi, H., and Hasegawa, N. 2010. Climatic factors of the difference of air temperature between the inside and the outside of shrine's forest (No.2). Proceedings of the General Meeting of the Association of Japanese Geographers 2010 Spring Meeting **77**: 87, March, Tokyo. (in Japanese)

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- Nakano, T., and Shinoda, M. 2009. Modeling temporal and spatial variation in CO<sub>2</sub> budget in Mongolian semiarid grasslands. Abstracts of the Meteorological Society of Japan 2009 Spring Meeting **95**: 208, May, Tsukuba. (in Japanese)
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- Fukushima, A., Matsumoto, J., and Takahashi, H. 2009. Secular and regional variability of seasonal precipitation in India. Abstracts of Meteorological Society of Japan 2009 Spring Meeting **95**: 349, May, Tsukuba. (in Japanese)
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- Okubo, S., and Takahashi, H. 2009. Long-term and seasonal trends in SPM concentration and its spatial distribution in the Kanto region, Japan. The 7th International Conference on Urban Climatology (ICUC-7), July, Yokohama.
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- Okubo, S., and Takahashi, H. 2010. Preliminary study of long-term variations in the occurrence frequency of daily maximum SPM concentrations in Japan. Proceedings of the General Meeting of the Association of Japanese Geographers 2010 Spring Meeting **77**: 233, March, Tokyo. (in Japanese)
- Yamato, H., Mikami, T., and Takahashi, H. 2009. The interaction between sea breezes and amount of temperature change in southern Kanto in summer. Abstracts of Meteorological Society of Japan

- 2009 Spring Meeting **95**: 304, May, Tsukuba. (in Japanese)
- Yamato, H., Mikami, T., and Takahashi, H. 2009. New urban heat island monitoring system in Tokyo metropolis. The 7th International Conference on Urban Climatology (ICUC-7), July, Yokohama.
- Takahashi, K., Takahashi, H., and Mikami, T. 2009. Relationship between wind system and urban heat island phenomenon in Tokyo ward area in summer (Part 3) —Nocturnal air pressure distribution corrected by assuming hydrostatic equilibrium—. Abstracts of the Meteorological Society of Japan 2009 Spring Meeting **95**: 176, May, Tsukuba. (in Japanese)
- Takahashi, K., Mikami, T., and Takahashi, H. 2009. Influence of the urban heat island phenomenon in Tokyo on land and sea breezes. The 7th International Conference on Urban Climate (ICUC-7), June, Yokohama.
- Hoque, R., and Matsumoto, J. 2010. Climatological pentad mean annual cycle of monsoon rainfall over Bangladesh. 5th International Workshop “Environment and Human Activities on Climate Workshop in South Asia”, January, Kyoto.
- Seto, Y., and Takahashi, H. 2009. Analysis of local wind systems in summer over the Kanto plain considered from the divergence field. Abstracts of the Meteorological Society of Japan 2009 Spring Meeting **95**: 259, May, Tsukuba. (in Japanese)
- Seto, Y., and Takahashi, H. 2009. Adjustment technique of observed wind by roughness parameter and logarithmic law: divergence field over the Kanto plain. Abstract collection of the 4th Japan-China-Korea Joint Conference on Meteorology: 269, November, Tsukuba.
- Seto, Y., and Takahashi, H. 2009. Analysis of divergence field in summer over the Kanto plain by using the observed wind adjusted by logarithmic law. Abstracts of the Meteorological Society of Japan 2009 Fall Meeting **96**: 485, November, Fukuoka. (in Japanese)
- Uchiyama, S., Takahashi, H., and Kanamori, H. 2009. Seasonal change of lightning activity over Africa based on TRMM observations. Equatorial Atmosphere Radar Symposium, September, Kyoto. (in Japanese)
- Uchiyama, S., Takahashi, H., and Kanamori, H. 2009. Seasonal change of lightning activity over Africa based on TRMM observations. Proceedings of the General Meeting of the Association of Japanese Geographers 2009 Fall Meeting **76**: 182, October, Okinawa. (in Japanese)
- Morita, J., Matsumoto, J., and Takahashi, H. G. 2009. Characteristics of rainfall over Bangladesh during monsoon withdrawal. Proceedings of the General Meeting of the Association of Japanese Geographers 2009 Fall Meeting **76**: 186, October, Okinawa. (in Japanese)
- Watanabe, J., Matsumoto, J., and Takahashi, H. G. 2009. Seasonal march of rainfall during winter

monsoon season over Indochina. Proceedings of the General Meeting of the Association of Japanese Geographers 2009 Fall Meeting **76**: 184, October, Okinawa. (in Japanese)

Ootsuka, Y. 2010. Regional characteristics of heavy rainfall in South Kanto and around the region in summer. General Meeting for Graduation Theses of Geography, March, Koganei. (in Japanese)



### **3. Laboratory of Environmental Geography**

#### **1) Staff**

Makiko WATANABE                      Professor/ PhD  
Soil Science

Shuichi OYAMA                          Associate Professor / PhD (D. Human and Environment)  
Regional Studies (Africa, South America), Biogeography, Ecological Anthropology

#### **2) Overview of Research Activities**

Our laboratory focuses on the relations between human and natural environment. For understanding processes enacted upon environment in local and regional scales, we try to integrate subdivisions of both physical and human geography together with interdisciplinary aspects of environmental sciences, such as botanical science, forest ecology, zoology, soil science, landscape design, political ecology, folklore, anthropology and so on. Research methods are in primary based on fieldworks, including weather observation, land survey, soil and vegetation surveys, and interview survey and in participative on laboratory analyses on soil-water analyses and interpretations of aerial photo and satellite imagery as well. Overseas field studies are carried out in Asia, Africa, Europe and South America. We are engaged in long-term fieldwork on (1) environmental changes and human responses in Africa, (2) cultural ecology of slash-and-burn cultivators in Africa, (3) domestication process of livestock and crops, and (4) vegetation and climatic landscape in North and South America and Siberia.

Recent research subjects are as follows;

- 1) Characterization of sclerotium grains as soil organic component in subalpine forests in Japan and Central Europe
- 2) Dynamics of water environment surrounding ancient temples in Kharga Oasis, Western Desert, Egypt
- 3) Land recovery scenario in the upper Mt. Pinatubo, Philippines
- 4) Evaluation of urban soils on basis of soil genesis
- 5) Geoecological research on landscape, vegetation and soil
- 6) Interrelation between environmental change and human response in savanna area of Africa

- 7) Cultural geography of slash-and-burn cultivators and development of cultivation system in miombo woodland zone of Africa
- 8) Applied ecological study to combat desertification in Sahel zone, Africa.
- 9) Domestication of Camelidae animals and *Solanum* crops in Andes, South America

### 3) List of Research Activities in FY2009

#### *Peer-reviewed Articles*

- Watanabe, M., Kogawa, K., Sugimura, T., Nakano, T., Tsukamoto, T., and Kamei, H. 2010. Interpretation of water environment around El-Zayyan Temple in Kharga Oasis, Western Desert, Egypt from a tentative environmental map based on ALOS pan-sharpened imagery. *Journal of the Remote Sensing Society of Japan* **30**: 11-18. (in Japanese with English abstract)
- Yoshida, S., Morishima, W., Watanabe, M., and Palijon, A. M. 2009. Morphological characteristics of silica body derived from grasses in a hilly area in central Luzon, Philippines. *Japanese Journal of Historical Botany* **17**: 33-36. (in Japanese)
- Inoue, Y., Baasansuren, J., Watanabe, M., Kamei, H., and Lowe, D. J. 2009. Interpretation of pre-AD 472 Roman soils from physicochemical and mineralogical properties of buried tephric paleosols at Somma Vesuviana ruin, southwest Italy. *Geoderma* **152**: 243-251.
- Takeda, M., Morishima, W., and Watanabe, M. 2009. Experimental study on influence of artificial soil pedon on characteristics of heat and water transfer in urban park. *Eco-Engineering* **21**: 113-117. (in Japanese)
- Oyama, S. 2009. Public sphere of the customary land management in agricultural villages and market-based land reform of Zambia. In *Rural Societies and Public Sphere in Africa*, ed. Y. Kodama, Tokyo: Institute of Developing Economies, JETRO, 147-183. (in Japanese)
- Shikata, K. 2010. Friendly relationship between banana and cocoa: Contemporary change of shifting cultivation system in tropical rainforest of southeastern Cameroon. In *People, Nature and History of African Tropical Forest 1: From Ecological Perspectives*, ed. D. Kimura, and K. Kitanishi, Kyoto: Kyoto University Press, 195-220. (in Japanese).
- Nonoyama, Y., Ohta, H., Narisawa, K., and Watanabe, M. 2009. Evaluation of efficiency as microbial cell carrier of Fungal Sclerotia found in forest soil. *Journal of the Society for Biotechnology, Japan* **87**: 518-522. (in Japanese)

### ***Other Articles***

- Oyama, S., and Mammam, I. 2010. Ecological knowledge of Hausa cultivators and *in situ* experiment of the land rehabilitation in Sahel, West Africa. *Geographical Reports of Tokyo Metropolitan University* **45**: 31-44.
- Yoshino, R. 2010. Souvenir gifts of Kumano-Kodo (Pilgrimage road) of the UNESCO world heritage: The representation of the regional character. *Ökumene Research* **1**: 21-29. (in Japanese)

### ***Reports***

- Oyama, S. 2009. New land law regulation and social confusion of the shifting cultivators in Republic of Zambia. In *Reports for Grant-in-Aid for Scientific Research (S): Integrated Research on African Way of Rural Development Based on Area Studies*, ed. M. Kakeya, 339-359. (in Japanese)
- Oyama, S. 2010. Soil nutrients and Nitrogen absorption of plants in Andean Mountains: Relating with domestication of wild potato species. In *RIHN (Research Institute for Humanity and Nature) Interim Report of Full Research Human Life, Aging, and Disease in High-Altitude Environments: Physio-Medical, Ecological and Cultural Adaption in "Highland Civilization"*, ed. K. Okumiya, 86-102. (in Japanese)
- Sakagami, N., and Watanabe, M. 2010. Some explanations for genesis of thin-interlaminated sediment under dwelling site in Shikiryou Ruin. In *Report of Excavation at Shikiryou Ruin, Ibusuki, Kagoshima, the Grant-in-Aid for Scientific Research from Japan Society for the Promotion of Science*, ed. M. Takano, 20-24. (in Japanese)

### ***Miscellaneous reports***

- Oyama, S. 2009. Interview: The origin of potato (*Solanum* spp.) in Andean Mountains. *Potato Culture* **55**: 3. (in Japanese)
- Oyama, S. 2010. The tackle to the land degradation and trial of land rehabilitation. *Seiko (Osaka Salesian High School)* **59**: 7-15. (in Japanese)
- Shikata, K. 2010. Love fortune of the forest. In *People, Nature and History of African Tropical Forests 1: From Ecological Perspectives*, ed. D. Kimura, and K. Kitanishi, Kyoto: Kyoto University Press, 191-192. (in Japanese).
- Myoga, S. 2010. Tracing the history of destroyed village I: HAMAGUCHI Goryou and Hiro-mura embankment — Recovery from tsunami damage in Hirogawa Cho, Wakayama Prefecture. *Chiri*

55(1): 64-71. (in Japanese)

Myoga, S. 2010. Tracing the history of destroyed village II: A village revived with seaweed — Todo-Hokke-Mura recovered from fire disaster (currently Shin-Esan Cho in Hakodate City, Hokkaido Prefecture). *Chiri* 55(2): 110-117. (in Japanese)

Myoga, S. 2010. Tracing the history of destroyed village III: Tenacity of inhabitants of Aogashima island — Recovery from catastrophic damage by volcanic disaster. *Chiri* 55(3): 74-83. (in Japanese)

### ***Presentations***

Watanabe, M., Kogawa, K., Sugimura, T., and Kamei, H. 2009. Ancient temple and water environment map around Kharga Oasis, Western Desert, Egypt based on ALOS pan-sharpened imagery. Abstracts of Japan Geoscience Union Meeting 2009: X228-P006 (CD-ROM), May, Makuhari. (in Japanese with English abstract)

Watanabe, M., Kogawa, K., Sugimura, T., and Kamei, H. 2009. Water environment around El Zayyan Temple in Kharga Oasis, Western Desert, Egypt— An attempt to provide environmental map based on ALOS pan-sharpened imagery. Proceedings of the 46th Spring Conference of the Remote Sensing Society of Japan: 219, May, Tokyo. (in Japanese)

Kamei, H., Watanabe, M., Ako, Y., and Kogawa, K. 2010. A village in Heian period revealed by underground survey—Shikiryou Ruin, Ibusuki, Kagoshima. Proceedings of the International Symposium on “The Reconstruction of Natural and the Cultural Environment in the Volcanic Eruption Affliction Place — Somma Vesuviana, Pinatubo, and Asama — Interdisciplinary Strategical Research 2009”: 16, February, Tokyo. (in Japanese)

Sugiura, Y., Watanabe, M., Sakagami, N., Nonoyama, Y., and Murayama, S. 2009. A comparative study of composition of neutral saccharides between sclerotia and soil. Proceedings of 89th Annual Meeting of Chubu Branch of Japanese Society of Soil Science and Plant Nutrition: 23-24, Nov., Shizuoka. (in Japanese)

Oyama, S. 2009. Mysterious animals of South America: Science of Alpaca (*Lama pacos*). Entertainment Science Program of Nippon Television Network Corporation, May, Tokyo. (in Japanese)

Oyama, S. 2009. Urban environment and urban culture. Anthropology for Environmental Issues (The School of Graduate Studies: Chair Professor M. Uchibori). The Open University of Japan, Guest Lecturer, Video Recording in June, Makuhari. (in Japanese)

- Oyama, S. 2009. Reconsidering domestication of potato (*Solanum* spp) related with Camelidae domestication. 56th Meeting of Society of Ethnobiology “Academic Territories of Ethnobiology”, July, Kyoto. (in Japanese)
- Oyama, S. 2009. Is Africa really poor?: Moral economy and market economy in Africa. Lecture for 1st Open Campus 2009 Tokyo Metropolitan University, July, Hachioji. (in Japanese)
- Kosaki, T., Takahashi, M., Ikazaki, K., Oyama, S., and Shinjo, H. 2009. The possibility of eco-tourism for education on soil, environment and science (2): The project for the desertification in Sahel of West Africa. Annual Meeting for Japanese Society of Soil Science and Plant Nutrition, September, Kyoto. (in Japanese)
- Sakagami, N., and Watanabe, M. 2009. Implications of sclerotia of *Cenococcum* species as a soil organic component. *Geochimica et Cosmochimica Acta*, Goldschmidt Conference Abstracts 2009: A1148, June, Davos.
- Shikata, K. 2010. Integration of cocoa growing and banana-based shifting cultivation in tropical rainforest of southeastern Cameroon. International Symposium Persisting Cultures and Contemporary Problems among the Congo Basin Forest People, March, Kyoto.
- Myoga, S. 2009. Consideration about the recovery process of land function around Rokurigahara, the foot of Mt. Asama (II). Proceedings of the General Meeting of the Association of Japanese Geographers 2009 Fall Meeting **76**: 66, October, Okinawa. (in Japanese)
- Nonoyama, Y., Narisawa, K., Ohta, H., and Watanabe, M. 2009. Bacterial community in sclerotia of *Cenococcum* species and soil in sub-alpine forest, central Japan. Geophysical Research Abstracts, Vol. 11, EGU General Assembly 2009, April, Vienna.
- Takishima, K., Oyama, S., and Oka, S. 2009. Formation process of *Salix reinii* colony and tree limit dynamics on the northwestern slope of the Mt. Fuji, Japan. Proceedings of the General Meeting of the Association of Japanese Geographers 2009 Fall Meeting **76**: 181, October, Okinawa. (in Japanese)
- Takishima, K. 2010. Formation process of *Salix reinii* colony and tree limit dynamics on the northwestern slope of the Mt. Fuji, Japan. The 30th Seminar of Master’s Thesis Related to Japanese Society of Ecology in Kanto Region. February, Hachioji. (in Japanese)
- Uoi, N., Murata, T., and Watanabe, M. 2009. Recognition of urban soils based on soil hardness profile and chemical properties. Proceedings of the General Meeting of the Association of Japanese Geographers 2009 Fall Meeting **76**: 73, October, Okinawa. (in Japanese)

Kurosawa, Y., Sakagami, N., and Watanabe, M. 2009. Characteristics of composition of metal elements in Sakura petals growing in urban environment. Proceedings of the 4th Annual Meeting of the Japanese Society of SAKURA: 8, December, Tokyo. (in Japanese)

## 4. Laboratory of Geographical Information Sciences

### 1) Staff

Hiroshi MATSUYAMA Associate Professor / PhD (D.Sc.)

Hydrometeorology, Geographical Information Sciences

Takeki IZUMI Assistant Professor / PhD (D.Eng.)

Urban Climatology, Geographical Information Sciences, Computational Meteorological Model

Daichi NAKAYAMA Assistant Professor / PhD (D.Sc.)

Geographical Information Sciences, Remote Sensing, Computational Geomorphology

### 2) Overview of Research Activities

This laboratory is going to study the natural environment as a whole which is composed of geomorphology, climate, hydrology, vegetation, and so on. Concretely, deductive approach and inductive approach are combined for conducting studies. The former approach is going to explain results from causes by physical laws such as mass balance, energy balance, equation of motion, and so on. The latter approach is going to explain facts demonstratively based on field surveys and *in situ* observations. Therefore, collection of quantitative data, digital mapping, statistical analyses, numerical modeling, and GIS (Geographical Information Systems) are main methods used in this laboratory.

The main study themes in this laboratory are listed as follows.

- 1) Energy and water cycle in the atmosphere and hydrosphere
- 2) Capturing snow distribution and snow water resources, along with snowmelt-runoff based on remote sensing techniques and field surveys
- 3) Quantitative evaluation of spectral reflectance characteristics of coniferous forests and their leaf area indices
- 4) Water environment around Mt. Aso and Tokyo metropolis
- 5) Numerical simulation of urban climate
- 6) Capturing surface conditions of cities using GIS
- 7) Monitoring and modeling natural environment and natural hazards

### 3) List of Research Activities in FY2009

#### *Peer-reviewed Articles*

- Matsuyama, H., and Izumi, T. 2009. Snowmelt-runoff analysis by using SRM (Snowmelt Runoff Model) —Case study of the upper reach of Uono river basin, Niigata prefecture—. *Journal of Japan Society of Hydrology and Water Resources* **22**: 409-418. (in Japanese with English abstract)
- Matsuyama, H., and Kezer, K. 2009. Long-term variation of precipitation around Lake Balkhash in Central Asia from the end of the 19th century. *SOLA (Scientific Online Letters on the Atmosphere)* **5**: 73-76, doi:10.2151/sola.2009-019.
- Hasegawa, K., Matsuyama, H., Tsuzuki, H., and Sweda, T. 2010. Improving the estimation of leaf area index by using remotely sensed vegetation index with BRDF signatures. *Remote Sensing of Environment* **114**: 514-519, doi:10.1016/j.rse. 2009.10.005.
- Saito, H., Nakayama, D., and Matsuyama, H. 2009. Comparison of landslide susceptibility based on a decision tree model and actual landslide occurrence: The Akaishi Mountains, Japan. *Geomorphology* **109**: 108-121, doi:10.1016/j.geomorph. 2009.02.026.
- Saito, H., Nakayama, D., and Matsuyama, H. 2010. Relationship between the initiation of a shallow landslide and rainfall intensity—duration threshold in Japan. *Geomorphology* **118**: 167-175, doi:10.1016/ j.geomorph. 2009.12.016.
- Saito, H., Nakayama, D., and Matsuyama, H. 2010. Two types of rainfall conditions associated with shallow landslide initiation in Japan as revealed by Normalized Soil Water Index. *SOLA (Scientific Online Letters on the Atmosphere)* **6**: 57-60, doi:10.2151/sola.2010-015.
- Inamura, T., Izumi, T., and Matsuyama, H. 2009. Effects of large cities on wind systems over Kanto plain when heavy rainfall occurred in Tokyo. *Journal of Japan Society of Civil Engineering A* **65**: 915-931. (in Japanese with English abstract)
- Narumiya, H., Nakayama, D., and Matsuyama, H. 2009. Estimation of groundwater circulation based on hydrochemical techniques along with the change of springwater and environment —A case study of Hino city, Tokyo metropolis—. *Journal of Japan Society of Hydrology and Water Resources* **22**: 223-234. (in Japanese with English abstract)
- Sakamoto, K., Nakayama, D., and Matsuyama, H. 2009. New topographic correction method of satellite image in the season of low solar elevation. *Journal of the Remote Sensing Society of*



*Japan* **29**: 471-484. (in Japanese with English abstract)

Hiruma, Y., Saito, H., Nakayama, D., Izumi, T., and Matsuyama, H. 2009. Quantitative study on the factors determining the distribution of *Abies mariesii* using a statistical decision-tree model. *Theory and Applications of GIS* **17**: 155-165. (in Japanese with English abstract)

### **Other Articles**

Matsuyama, H. 2010. 5. Amazon River. In *Satellite View of the Earth Topography: Japan and World*, ed. T. Kato, Y. Yamaguchi, H. Watanabe, H. Yamazaki, Y. Shiokawa, and M. Komoda, Tokyo: Asakura-Shoten, 20-23. (in Japanese)

Kuroda, S., Komatsu, T., Teuchi, K., Komori, J., Nuimura, T., Kanie, M., Terada, K., Ishii, M., and Iwata, S. 2009. The species of a buried tree from the Iwatake stage deposits and its <sup>14</sup>C age from the Matsukawa-Kitawatairi River at the foot of Mt. Shirouma-dake, Nagano prefecture, central Japan. *Geographical Reports of Tokyo Metropolitan University* **45**: 11-19.

Hasegawa, K. 2010. The biology in the cinema —Cytology and genetics—. *Bulletin of Komazawa University Senior High School* **26**: 35-44. (in Japanese)

Saito, H., Nakayama, D., and Matsuyama, H. 2009. Relationship between the initiation of shallow landslide and the characteristics of rainfall event based on the rainfall intensity—duration. *Proceedings of Conference of GIS Association of Japan* **18**: 57-60. (in Japanese with English abstract)

Inamura, T., Izumi, T., and Matsuyama, H. 2009. Effects of large cities on wind systems over the Kanto plain when heavy rainfall occurred in Tokyo. *Proceedings of the 7th International Conference on Urban Climate, Yokohama, June-July, 2009*: P3-42 (CD-ROM).

### **Books**

The Editorial Committee of Bibliography Catalog of Geography, the Human Geographical Society of Japan (including H. Matsuyama) 2009. *Bibliography Catalog of Geography Vol. 12*. Tokyo: Kokon-Shoin. (in Japanese)

### **Reports**

Matsuyama, H. 2010. Multi-angular optical remote sensing for assessing leaf area index. *Annual Report 2008, Center for Environmental Remote Sensing, Chiba University* **14**: 53-54. (in Japanese)

- Matsuyama, H., Izumi, T., and Hasegawa, K. 2009. Estimation of spatial distribution of leaf area index at *Larix leptolepis* forest based on the bidirectional reflectance distribution function. *Annual Report of the Sumitomo Foundation in 2008*: 45. (in Japanese)
- Matsuyama, H. 2010. Estimation of groundwater circulation based on springwater temperature and concentration of silica along with the change of springwater and its surroundings — A case study of Hino city, Tokyo metropolis—. In *Academic Research by Professionals Report on the Results of the Supported Researches*, ed. Tokyu Foundation for Better Environment **38**(280): 1-16. (in Japanese with English abstract)
- Matsuyama, H. 2010. Estimation of groundwater circulation based on springwater temperature and concentration of silica along with the change of springwater and its surroundings — A case study of Hino city, Tokyo metropolis—. In *Academic Research by Professionals Report on the Results of the Supported Researches (summary)*, ed. Tokyu Foundation for Better Environment **38**: 14.
- Izumi, T. 2009. Take off ! “Kankyo-Sanshiro” —Looking back to the past 15 years and looking ahead to the future! *The Memorial Issue of the 15th Anniversary of Kankyo-Sanshiro*: 8-11. (in Japanese)
- Izumi, T. 2010. 2-2 Redevelopment for Asagaya Jyutaku, 3-1 Validity of the relaxed neighborhood planning, 3-2 Challenges of neighborhood planning by citizens. In *SUR (Sustainable Urban Regeneration) Special Issue 02*, ed. M. Ishikawa, H. Jinnai, T. Izumi, and M. Matsumoto, Center for Sustainable Urban Regeneration, the University of Tokyo, 19-25, 30-35. (in Japanese)
- Hasegawa, K., Izumi, T., and Matsuyama, H. 2009. Relationship between the bidirectional reflectance distribution function in *Larix leptolepis* and its phenology at Yatsugatake. *Proceedings of the 11th CEReS Symposium on Environmental Remote Sensing*: 18-20. (in Japanese)

### **Book Reviews**

- Matsuyama, H. 2009. Book review (Nature in Arid Region, Kokon-Shoin), *Tenki* **56**: 591-592. (in Japanese)
- Matsuyama, H. 2010. Book review (The Editorial Committee of Forest Hydrology: Forest Hydrology —Exploring the Fate of Water in Forest Ecosystems—). *Chiri* **55**(1): 120. (in Japanese)

### **Miscellaneous Reports**

- Matsuyama, H. 2009. Sacred places of cartography (supplementary version 2). *Map Journal* **161**: 24-26. (in Japanese)
- Matsuyama, H. 2009. Sacred places of cartography (revenge version). *Map Journal* **162**: 16-18. (in Japanese)
- Saito, H. 2009. Report of “Study meeting on natural environments and human lives in mountainous region”. *Journal of the Japan Landslide Society* **46**(1): 67-69. (in Japanese)
- Saito, H. 2009. Report of “Summer school 2009 in Niigata prefecture”. *Journal of the Japan Landslide Society* **46**(4): 70. (in Japanese)
- Saito, H. 2010. Where do shallow landslides occur? *GIS NEXT* **30**: 76. (in Japanese)

### ***Presentations***

- Matsuyama, H., and Izumi, T. 2009. Snowmelt-runoff analysis by using SRM (Snowmelt Runoff Model) —Case study of the upper reach of Uono river basin, Niigata prefecture—. Proceedings of the General Meeting of the Association of Japanese Geographers 2009 Fall Meeting **76**: 82, October, Okinawa. (in Japanese)
- Matsuyama, H., and Kezer, K. 2009. Long-term variation of precipitation around Lake Balkhash in Central Asia from the end of 19th century. Study Meeting of Ili Project, April, Kyoto. (in Japanese)
- Matsuyama, H. 2009. How to be a researcher —A case of my own experience—. Lecture of Career Design, Career Support Center of Kyoto University, May, Kyoto. (in Japanese)
- Matsuyama, H. 2009. Rise and fall around Aral Sea in Central Asia along with its climate change. Meguro City College “Environmental Change and History”, July, Meguro. (in Japanese)
- Matsuyama, H. 2009. GIS Day in Tokyo 2005—2009: History of collaboration among industry, academic, and public society for five years. Industry, Academic, and Public Collaboration Seminar, July, Hachioji. (in Japanese)
- Matsuyama, H. 2010. How do global warming and urbanization affect springs in Tokyo? IYPE Science Bar, March, Akihabara. (in Japanese)
- Matsuyama, H., and Miyano, H. 2010. Diagnostic study of a warming mechanism of spring water temperature based on field observations and numerical simulation — Case study of Masugata-no-ike, Tokyo, Japan—. Proceedings of the General Meeting of the Association of Japanese Geographers 2010 Spring Meeting **77**: 103, March, Tokyo. (in Japanese)
- Izumi, T., Saito, H., Nakayama, Y., Nakamura, K., Fukumoto, R., Sasaki, T., Yokomizo, M., Katagiri,

- Y., and Ishikawa, M. 2010. Development and application study of new assistant tools for urban planning based on FOSS4G —For the effective collaboration between landscape designers and architects—. Proceedings of the General Meeting of the Association of Japanese Geographers 2010 Spring Meeting **77**: 197, March, Tokyo. (in Japanese)
- Nakayama, D., Sakamoto, K., and Matsuyama, H. 2009. New topographic correction method of satellite image in the season of low solar elevation. 7th International Conference on Geomorphology, July, Melbourne, Australia.
- Koarai, M., Suzuki, T., Nakayama, D., Wachi, T., and Fujinawa, A. 2009. Estimation of tephra hazard using tephra GIS. Abstract of Japan Geoscience Union Meeting 2009: X165-003 (CD-ROM), May, Makuhari. (in Japanese with English abstract)
- Suzuki, T., Koarai, M., and Nakayama, D. 2009. Construction of tephra database on GIS. Workshop: Tephra Studies in Japan for Active Tephra 2010 in Kyushu, July, Hachioji. (in Japanese)
- Aoyama, M. 2010. Ground surface temperature regimes on and around blocky landforms in Mt. Shirouma and the upper Kurobe river drainage basin, northern Japanese Alps. Proceedings of the General Meeting of the Association of Japanese Geographers 2010 Spring Meeting **77**: 256, March, Tokyo. (in Japanese)
- Hasegawa, K., Omi, H., Izumi, T., and Matsuyama, H. 2010. Retrieving a parameter of forest structure based on the analysis of satellite image with high spatial resolution —Toward the estimation of spatial distribution of leaf area index—. The 12th CEReS Symposium on Environmental Remote Sensing, February, Chiba. (in Japanese)
- Saito, H., Urita, S., Inamura, T., and Matsuyama, H. 2009. Heavy rainfall in the end of August 2008 evaluated by Soil Water Index —A case study of Hachioji city—. Abstracts of Meteorological Society of Japan 2009 Spring Meeting **95**: 92, May, Tsukuba. (in Japanese)
- Saito, H., Nakayama, D., and Matsuyama, H. 2009. Mountain slope partition focusing on a hierarchy of slope unit using digital elevation models. Conference Abstracts of the “7th International Conference on Geomorphology” (CD-ROM): 451, July, Melbourne, Australia.
- Saito, H., Nakayama, D., and Matsuyama, H. 2009. Comparison of landslide susceptibility based on a decision-tree model and actual landslide occurrence: A case of the Akaishi Mountains, Japan. Proceedings of the 48th Annual Meeting of the Japan Landslide Society: 69-70, August, Niigata. (in Japanese)
- Saito, H., Nakayama, D., and Matsuyama, H. 2009. Relationship between the initiation of a shallow

- landslide and the characteristics of rainfall event based on the rainfall intensity—duration in Japan. Proceedings of the General Meeting of the Japanese Geomorphological Union 2009 Fall Meeting (Transactions, Japanese Geomorphological Union **31**: 62), October, Kyoto. (in Japanese)
- Saito, H. 2009. Utilization of FOSS4G for making hazard map: Raster data analysis using Quantum GIS. 18th Conference of GIS Association of Japan, October, Niigata. (in Japanese)
- Saito, H., Nakayama, D., and Matsuyama, H. 2009. Relationship between the initiation of shallow landslide and the characteristics of rainfall event based on the rainfall intensity—duration. 18th Conference of GIS Association of Japan: 3A-5, October, Niigata. (in Japanese)
- Saito, H., Nakayama, D., and Matsuyama, H. 2009. A preliminary study on the relationship between initiation of shallow landslides and rainfall intensity—durations in Japan. Proceedings of the General Meeting of the Association of Japanese Geographers 2009 Fall Meeting **76**: 79, October, Okinawa. (in Japanese)
- Saito, H., Nakayama, D., and Matsuyama, H. 2009. Quantitative analysis of the characteristics of a rainfall condition associated with shallow landslides relationship between the initiation of shallow landslides and rainfall intensity using Soil Water Index. Research Abstracts on Spatial Information Science CSIS Days 2009: 7, November, Kashiwa. (in Japanese)
- Saito, H., Nakayama, D., and Matsuyama, H. 2009. Geographical information study on the relationship between rainfall intensity and duration associated with shallow landslides in Japan. Proceedings of “Asia-Pacific Symposium on New Technologies for Prediction and Mitigation of Sediment Disasters”, JSECE Publication **55**: 78-79, November, Tokyo.
- Saito, H., Nakayama, D., and Matsuyama, H. 2010. Relationship between the shallow landslide initiation and rainfalls characterized by short-duration—high-intensity (SH), and long-duration—low-intensity types. The 1st GIS Landslide Workshop, February, Tsukuba. (in Japanese)
- Saito, H., Nakayama, D., and Matsuyama, H. 2010. Two rainfall types for shallow landslide initiation in Japan as revealed by Soil Water Index. Proceedings of the General Meeting of the Association of Japanese Geographers 2010 Spring Meeting **77**: 121, March, Tokyo. (in Japanese)
- Teshirogi, K., and Saito, H. 2009. Seasonal variation in the day-trip herding of goats and its factor in semi-arid Namibia: Analysis by the long-term herding data of GPS collars. Proceedings of the General Meeting of the Association of Japanese Geographers 2009 Fall Meeting **76**: 173, October, Okinawa. (in Japanese)
- Teshirogi, K., and Saito, H. 2010. Relationship between the seasonal variation in the day-trip herding

- of goats and vegetation in semi-arid Namibia. 57th Annual Meeting of Ecological Society of Japan: P1-296, March, Tokyo. (in Japanese)
- Inamura, T., Izumi, T., and Matsuyama, H. 2009. Effects of large cities on wind systems over the Kanto plain when heavy rainfall occurred in Tokyo. 7th International Conference on Urban Climate, July, Yokohama.
- Nakayama, Y. 2010. Relationship between potential eelgrass distribution and the fresh water environment in the shallow region of inner Tokyo Bay. Proceedings of the General Meeting of the Association of Japanese Geographers 2010 Spring Meeting **77**: 200, March, Tokyo. (in Japanese)
- Urita, S., Saito, H., Nakayama, D., and Matsuyama, H. 2010. Diagnostic study on the spatial distribution of potential landslide disaster occurrence as revealed by Soil Water Index. The 1st GIS Landslide Workshop, February, Tsukuba. (in Japanese)
- Nemoto, Y., Nakayama, D., and Matsuyama, H. 2010. Re-evaluation of the flood control system of Shingen-tsutsumi based on an inundation flow simulation. Proceedings of the General Meeting of the Association of Japanese Geographers 2010 Spring Meeting **77**: 199, March, Tokyo. (in Japanese)
- Watanabe, T., Inamura, T., Izumi, T., and Matsuyama, H. 2009. Numerical simulation how "Matsubori-kaze" is affected by flow directions around Mt. Aso. Abstracts of Meteorological Society of Japan 2009 Spring Meeting **95**: 251, May, Tsukuba. (in Japanese)
- Fukuhara, Y., Inamura, T., Izumi, T., and Matsuyama, H. 2009. Cool island effect of large green spaces in Tokyo metropolis as revealed by Regional Atmospheric Modeling System (RAMS). Abstracts of Meteorological Society of Japan 2009 Spring Meeting **95**: 264, May, Tsukuba. (in Japanese)
- Hiruma, Y., Saito, H., Nakayama, D., Izumi, T., and Matsuyama, H. 2009. Quantitative study on the factors determining the distribution of *Abies mariesii* using a statistical decision-tree model — Toward the detection of snow-covered area with higher accuracy by remote sensing technique—. Proceedings of 2009 Annual Conference, Japan Society of Hydrology and Water Resources: 82-83, August, Kanazawa. (in Japanese)

## 5 Laboratory of Urban and Human Geography

### 1) Staff

Yoshio SUGIURA                      Professor / PhD (D.Sc.)

Human Geography

Yoshiki WAKABAYASHI              Professor / PhD (D.Sc.)

Urban Geography, Behavioral Geography, Geographical Information Sciences

Akihiro TAKINAMI                      Associate Professor / PhD (D.Lit.)

Cultural Geography, Tourism Study

Yuko TAKEDA                              Assistant Professor / PhD (D.Lit.)

GIS, Urban Geography

Hiroyuki TSUBOMOTO                  Assistant Professor / PhD (D.Sc.)

Urban Geography, Office Study

Michiko HARAYAMA                      Assistant Professor

Bibliometrics

(Concurrent staff)

Toshio KIKUCHI                              Professor / D.Sc.

Agricultural and Rural Geography, Regional Geography of Oceania, Nature Based Tourism

### 2) Overview of Research Activities

This research unit specializes in human geography, with special emphasis on the city and its environs. Our research interests center on the structural explanation of the relationship between human activities and geographic environment by employing approaches of social sciences and humanities. Methodologically, the emphasis lies largely on positivistic (viz., quantitative or mathematical); fieldwork is also encouraged. The research interests cover quantitative,

socioeconomic, urban and behavioral geography. The main themes of our current research are as follows:

1. Mathematical modeling of human geographic phenomena
2. Regional analysis of human geographic phenomena
  - 1) Relationship between human activities and geographic environment
  - 2) Land use change in the city and its suburbs
  - 3) Spatial organization of the society
  - 4) Transformation of human activities brought about by environmental change
3. Geographical studies of urban systems
  - 1) Spatial structures of intra-urban system
  - 2) System of cities
4. Geographical thought
  - 1) History of modern geography
  - 2) Bibliometric research of geographical studies

### **3) List of Research Activities in FY2009**

#### ***Peer-reviewed Articles***

- Wakabayashi, Y. 2009. Progress in perceptual-behavioral geography in Japan: Retrospect and prospect. *Japanese Journal of Human Geography* **61**: 266-281. (in Japanese with English abstract)
- Wakabayashi, Y., and Nishimura, Y. 2010. Notes on the issues of “GIS and society”: Critical GIS as an alternative geographic information science. *Geographical Review of Japan* **83**: 60-79. (in Japanese with English abstract)
- Kikuchi, T., and Arima, T. 2010. Regional characteristics of conservations and tourism on environmental resources in Australian national parks. *The International Journal of Tourism Science* **3**: 41-55. (in Japanese)
- Yabe, N., Arima, T., Okamura, Y., and Kadono, T. 2010. An agenda on tourist activity survey using GPS and investigation of analysis methods. *The International Journal of Tourism Science* **3**:17-30. (in Japanese)
- Liang, H. S. 2010. Hohhot: From a traditional Mongolian city to a multi-ethnic city. *Urban*



*Geography of Japan* **5**: 80-86. (in Japanese)

***Other articles***

OECD ed., translated into Japanese by H. Kamiya, K. Kuwazuka, Y. Koshikura, Y. Yui, T. Nakazawa, Y. Takeda, M. Kukimoto, and Y. Wakabayashi 2010. *OECD Regions at a Glance 2009*. Tokyo: Akashi-Shoten. (in Japanese)

Takinami, A. 2009. Tourist experience narrated by ordinary tourists in travel magazines. In *Spaces for Tourism*, ed. K. Kanda, Kyoto: Nakanishiya, 145-153. (in Japanese)

Takinami, A. 2010. Aulnay-sous-bois and football: A territory of Paris suburb. *Notes in Theoretical Geography* **17**:1-20. (in Japanese).

Tsubomoto, H. 2010. Office location in Tokyo metropolitan area. In *Metropolitan Areas (Renewal Version)*, ed. K. Tomita, and T. Fujii, Tokyo: Kokon-Shoin, 36-37. (in Japanese)

Tsubomoto, H. 2010. Tokyo and South Kanto. In *Results and Problems of Economic Geography VII*, ed. Japan Association of Economic Geographers, Tokyo: Nihon Keizai Hyoronsha, 238-245. (in Japanese)

Yabe, N., Arima, T., Okamura, Y., and Kadono, T. 2009. An analysis of the pedestrian GPS tracking data at the Ueno Zoo. *Proceedings of JITR Annual Conference* **24**: 229-232. (in Japanese)

Arima, T. 2009. The process of generating tourism resource with rural gentrification: A case study of "Meruhen architectures" in Oyabe, Toyama. *Proceedings of JITR Annual Conference* **24**: 161-164. (in Japanese)

Arima, T. 2009. The spatio-temporal analysis of space uses in Ueno Zoological Garden and Tama Zoological Park. *Proceedings of Conference of GIS Association of Japan* **18**: 9-14. (in Japanese)

Arima, T. 2010. Definitions and research perspectives of "Ecotourism". In *Global Tourism*, ed., M. Asamizu, and F. R. Schumann, Tokyo: Kumpul, 61-77.

Arima, T. 2010. Development process of urban tourist area: A case study of Odaiba in Tokyo. *Geographical Reports of Tokyo Metropolitan University* **45**: 45-56.

Koizumi, R. 2010. Spatial patterns of young unmarried people living with their parents in Tokyo metropolitan area. *Geographical Reports of Tokyo Metropolitan University* **45**: 57-66.

Hanzawa, S., Sugiura, Y., and Harayama, M. 2010. Development of blueberry picking gardens as a tourist farm in Nerima Ward, Tokyo. *The International Journal of Tourism Science* **3**:155-168. (in Japanese)

### ***Book reviews***

Arima, T. 2009. Book review (Watanabe, T. ed. National Park & Protected Area Management Series Vol. 1: Mountain Trails: Conservation and Management). *Geographical Review of Japan* **82B**: 42-43.

### ***Miscellaneous reports***

Wakabayashi, Y. 2010. Representation and usage of maps in the web sites on the Internet. *GIS NEXT* **30**: 92-93. (in Japanese)

Takinami, A. 2010. Les Halles and Forte dei Marmi: Counterpoint between travel and story. *Mahora* **62**:16-17. (in Japanese)

### ***Presentations***

Wakabayashi, Y. 2009. Recent trend and regional differences of nursery service provision in Japan from the viewpoint of lowering fertility rate. ICAS6, August, Daejeon, Korea.

Wakabayashi, Y. 2009. Present condition and problems of cartography/GIS education in Tokyo Metropolitan University. Annual Conference of the Japan Cartographers Association, August, Tokyo.

Wakabayashi, Y. 2009. Representation of geospatial information and human spatial cognition. Symposium on the Spatial Information Science and Urban Analysis for the Future, September, Tokyo.

Wakabayashi, Y., Nagami, Y., and Itoh, S. 2009. The use of geospatial information and spatial cognition of taxi drivers in Tokyo. 18th Annual Conference of GIS Association of Japan, October, Niigata.

Kukimoto, M., Wakabayashi, Y., and Yui, Y. 2010. Provision system of child-care services in Okinawa Prefecture: The case of Naha City. Proceedings of the General Meeting of the Association of Japanese Geographers 2010 Spring Meeting **77**: 273, March, Tokyo. (in Japanese)

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