

# **Annual Report 2014**

**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 / D.Sc.  
Sedimentology, Quaternary Geology, Marine Geology

## 2) Overview of Research Activities

We focus on various earth scientific phenomena and processes on the solid earth surface in order 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 FY2014

### *Peer-reviewed Articles*

Yamazaki, H. 2014. Present state and issue on the active fault evaluation. *Bulletin of Japan Association for Earthquake Engineering* **24**: 2-7. (in Japanese)

### *Other Articles*

Yamazaki, H. 2014. 1-1-3 Outline of Geology of Hachioji. In *History of the Hachioji City New edition, Natural history*. Hachioji City, pp.14-16. (in Japanese)

Yamazaki, H. 2014. 2-1-1 Preface. In *History of the Hachioji City New edition, Natural history*. Hachioji City, pp.34-35. (in Japanese)

Yamazaki, H. 2014. 2-1-8 Natural hazard in Hachioji. In *History of the Hachioji City New edition, Natural history*. Hachioji City, pp.73-89. (in Japanese)

Yamazaki, H. 2014. 4-1-1 Changing Nature of Hachioji. In *History of the Hachioji City New edition, Natural history*. Hachioji City, pp.506-515. (in Japanese)

- Suzuki, T. 2015. Hazard maps for volcanoes. In *How to utilize the hazard maps for disaster prevention and mitigation*, ed. Suzuki, Y., Iwanami Shoten, pp.110-127. (in Japanese)
- Suzuki, T. 2015. Landslide disaster in the Izu-oshima Island by the typhoon wipha (1326) in 2013: A landslide disaster as a blind spot and the hazard map. In *How to utilize the hazard maps for disaster prevention and mitigation*, ed. Suzuki, Y., Iwanami Shoten, pp.127-130. (in Japanese)
- Suzuki, T. 2015. Tephra at Kami-tsurugaya, Nisato Town (former Nisato Village), Kiryu City, Gunma Prefecture. *Bulletin of the Tohoku University Museum* **14**: 276. (in Japanese)
- Higashino, T., Nakagawa, S., Ogawa, Y. and Tamura, I., 2014. An Examination of Kikai-Akahoya Ash found from drill cores in the coastal plains of Ishikawa Prefecture and the northern part of Fukui prefecture in central Japan. *Japan sea Research (Kanazawa University)* **45**: 63-74. (in Japanese)
- Ueki, T. 2014. The AMS 14C ages of the debris flow deposits in the Nagashima area, central Mie Prefecture, southwest Japan. *Bulletin of the Geological Survey of Japan* **65**: 67-70. (in Japanese with English abstract)
- Ueki, T. 2014. Higher terrace deposits along the Katakami River, central Mie Prefecture, southwest Japan. *Bulletin of the Geological Survey of Japan* **65**: 105-111. (in Japanese with English abstract)
- Ueki, T. 2015. Broken rounds from the Pli-Pleistocene Mitoyo Group, in western Kagawa Prefecture, southwest Japan, and their tectonic implication. *The University Bulletin of Chiba Institute of Science* **8**: 51-56. (in Japanese with English abstract)
- Ueki, T. 2015. A case report of active learning in a major subject of earth science, “Earthquake and hazards”: in-class book-reading and letter-writing. *The University Bulletin of Chiba Institute of Science* **8**: 145-153. (in Japanese with English abstract)
- Ueki, T. and Suzuki, T. 2014. 2-3Geomorphology and geology of hills. In *History of the Hachioji City New edition*, Natural history. Hachioji City, pp.39-51. (in Japanese)

#### ***Books/ Reports/ Book Reviews***

- Yamazaki, H. 2014. Why is Mt. Fuji located in there? Text book for NHK radio program “Science and human beings”, January to March of 2015: 159p. (in Japanese)
- Yamazaki, H. 2014. Evaluation of in-site fault in the nuclear power plant, An example of the Tsuruga nuclear power plant. The promoting society of the security and use of atomic energy, An earthquake / a tsunami subcommittee report, 124p. (in Japanese)
- Suzuki, T. 2014. 3.2.2. High-resolution tephrochronological survey for the estimation of mean slip rate and accumulated displacement of the fault zone. *2013 Report of the integrated research project for the Tachikawa Fault Zone*: 75-94. (in Japanese)
- Shirai, M. 2014. Book review (Ishibashi, K.: Nankai Trough Earthquake–History, science and society). *The Quaternary Research* **53**: 235. (in Japanese)
- Hara, H., Ueki, T. and Tsujino Y. 2014. Geology of the Kitagawa District. Quadrangle Series, 1:50,000. Geological Survey of Japan, AIST, 72 p and 1 map. (in Japanese with English Abstract)
- Takemura T., Ueki, T. and Endo, K. 2014. 3.6 Subsurface geology of Tokyo area. In *Subsurface geology of the Kanto District New edition*, The Kanto branch of Japanese Geotechnical Society, Tokyo, 116-129. (in Japanese)

#### ***Miscellaneous Reports***

- Suzuki, T. 2014. Tephra studies of Prof. Shinji NAGAOKA. *Monthly Chikyu* **36**: 201-204. (in Japanese)
- Okuno, M., Suzuki, T, Moriwaki, H. and Suzuki, T. 2014. Introduction to the special issue on “Professor Shinji Nagaoka: Field works on marine, mountain and volcano”. *Monthly Chikyu* **36**: 190-197. (in Japanese)
- Utsugawa, T. 2014. A report on the field trip of the 2014 annual meeting of the Sedimentological Society of Japan. *Journal of the Sedimentological Society of Japan* **73**: 73-76. (in Japanese)

Nanri, S. 2014. An impression of Mt. Fuji Excursion hosted by Kanto Branch. *The Geological Society of Japan News* 17 (11): 49. (in Japanese).

### ***Presentations***

- Yamazaki, H. 2014. The active fault is misunderstood. Let's remove a rumor and push forward true disaster prevention. Lecture of Inagi IC College, May, Inagi. (in Japanese)
- Yamazaki, H. 2014. Let's study the Tachikawa fault. Lecture for Midori Hou-no-ki school, Midori branch of Koganei-shi Community Center, June, Koganei. (in Japanese)
- Yamazaki, H. 2014. Earthquake and hazard prevention. Lecture for students of Iruma-gawa junior high school, June, Sayama. (in Japanese)
- Yamazaki, H. 2014. Active fault issue on the nuclear energy. Lecture for the Japan Nuclear Safety Institute general meeting, June, Mita. (in Japanese)
- Yamazaki, H. 2014. Global environment change, energy problem and atomic energy issue to read from the history of human development. Lecture at the Tohoku Energy Conference, July, Sendai. (in Japanese)
- Yamazaki, H. 2014. Natural environment and hazard for Kanagawa Prefecture – deepen understanding to nature and prepare for a future disaster –. Lecture of the Super Science High School project at Seisho High School, Kanagawa Prefecture, July, Odawara. (in Japanese)
- Yamazaki, H. 2014. Science and engineering fusion toward the active fault-free society. Study meeting on the active fault and nontectonic fault at Disaster Prevention Research Institute Kyoto University, August, Uji. (in Japanese)
- Yamazaki, H. 2014. Recent study of the physical geography – Human development and energy problem –. A 2014 teacher's license update class, Tokyo Metropolitan Univ. August, Hachioji. (in Japanese)
- Yamazaki, H. 2014. Let's know and prepare for future activity of the Tachikawa fault. Social Education Hall of Mitaka city, November, Mitaka. (in Japanese)
- Yamazaki, H. 2014. Learn, watch and walk on the Tachikawa fault. Open-College of the Extension Center of Waseda University “Musashino Upland and Tamagawa Waterworks”, November, Nakano. (in Japanese)
- Yamazaki, H. 2014. We need the calm discussion on the nuclear power generation, active faults and HLW disposal. Lecture for the Tohoku Energy Conference, November, Aomori. (in Japanese)
- Yamazaki, H. 2014. Natural hazards and History – Right measures method for the Tachikawa fault –. Mitaka-shi cultural assets lecture of 2014, November, Mitaka. (in Japanese)
- Yamazaki, H. 2014. Recent topic on the active fault. Lecture for the 2014 meeting of Hiratsuka disaster prevention group, December, Hiratsuka. (in Japanese)
- Yamazaki, H. 2015. Nuclear facilities and the active fault issue. Special lecture of the Specialized Investigation Committee for the nuclear facility and engineering risk assessment, Atomic Engineering Society of Japan, February, Hongo. (in Japanese)
- Yamazaki, H. 2015. Why is Mt. Fuji located in there? NHK radio program “Science and human beings”, Broadcasted from the Second NHK Broadcasting Station, January to March, Aoyama. (in Japanese)
- Yamazaki, H. 2015. The Tachikawa fault and its future hazard prevention. Tanashi community center of Nishi-Tokyo city. March, Tanashi. (in Japanese)
- Yamazaki, H. 2015. The mechanism of the volcanic eruption. Can we know and predict the situation of the volcanic activity? The 3rd lecture for the local problem of the Akishima-shi communication hall “Protect our life from natural disaster”, March, Haijima. (in Japanese)
- Yamazaki, H. 2015. What kind of thing will be caused in our living region by the future huge earthquake? The 4th lecture for the local problem of the Akishima-shi communication hall “Protect our life from natural disaster”, March, Haijima. (in Japanese)
- Toyokura, I., Aoto, S., Kawada, A., Sudo, H., Fukui, K., Matsuzaki, T., Watanabe, H., Yamazaki, H. and Nakayama, T.

2014. The distribution of the concealed Quaternary fault found inside of the compound of the University of Tokyo by Dr. Y. Sakaguchi, JSAGF. Abstract O-11, pp.42-43, October, Sendai. (in Japanese)
- Suzuki, T. and TMU GROUP FOR, Izu-oshima typhoon wipha (1326) disaster 2014. Preliminary report on the landslides, Oct. 2013, Izu-Oshima Volcanic island, central Japan: Shallow landslide, landforms. *Abstracts of Japan Geoscience Union Meeting 2014*: HDS29-P08, April, Yokohama. (in Japanese with English abstract)
- Suzuki, T. 2014. Geological structure interpreted from two boring cores beside the Tachikawa Fault Zone, Tokyo, NE Japan. *Abstracts of Japan Geoscience Union Meeting 2014*: SSS34-P11, April, Yokohama. (in Japanese with English abstract)
- Suzuki, T., Kasahara, A., Yagi, H., Imaizumi, T. and Yoshida, A. 2014. Late Quaternary tephra and basin fill sediments under Ukinuma, Murayama city in the north part of Yamagata basin. *Abstracts of Japan Geoscience Union Meeting 2014*: HQR24-02, May, Yokohama. (in Japanese with English abstract)
- Suzuki, T. 2014. Overview of tephrochronological study on Kazusa Group, the standard Quaternary marine sediments, central Japan. *Abstracts of Japan Geoscience Union Meeting 2014*: SGL44-07, May, Yokohama. (in Japanese with English abstract)
- Suzuki, T., Nakajima, E., Kasahara, A., Nishizawa, F., Teraguchi, K. and Aono, M. 2014. Early Pleistocene tephra detected from two boring cores beside the Tachikawa Fault Zone, Tokyo, NE Japan. *Japan Association for Quaternary Research, Programme and Abstracts 44*: 6, September, Kashiwa. (in Japanese)
- Suzuki, T. 2014. Earthquake and geological hazards in the Tama area: recent information on the Tachikawa Active Fault and the Great Earthquake beneath Tokyo metropolitan area. Symposium on disaster prevention and regional cooperation for museums in Tama area. October, Tachikawa. (in Japanese)
- Suzuki, T. 2015. 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. January, Shinjuku. (in Japanese)
- Suzuki, T. 2015. Eruption of Fuji and its related environmental changes. Hachioji Eco Hiroba, January, Hachioji. (in Japanese)
- Suzuki, T. 2015. Distribution, Thickness, Age and Potential Landslide of So-called Loam (Weathered Tephric Soil Deposits), Japan. Disaster Prevention Research Institute, Kyoto University Annual Meeting 2014, February, 2015, Uji. (in Japanese)
- Suzuki, T. 2015. Landform change and distribution of volcanic blocks of 2014 Ontake Eruption based on satellite image and LIDAR. Meeting of Grants-in-Aid for Scientific Research on the 2014 Ontake Eruption, March, Nagoya. (in Japanese)
- Suzuki, T. 2015. Volcanoes and earthquakes of the Japanese Islands. Asahi Culture Center Yokohama, March, Yokohama. (in Japanese)
- Ishiyama, T., Hirouchi, D., Sato, H., Suzuki, T., Kobayashi, K., Koriya, Y., Omata, M. and Shibata, T. 2014. Pit excavation along the Tachikawa fault at Sayama Shrine Site. *Abstracts of Japan Geoscience Union Meeting 2014*: SSS34-P10, April, Yokohama. (in Japanese with English abstract)
- Murata, M. and Suzuki, T. 2014. Tephrochronological study on the Kazusa Group at the Rinshinomori Park in the Meguro Ward and the Togoshi in the Shinagawa Ward, Tokyo. *Japan Association for Quaternary Research, Programme and Abstracts 44*: 187, September, Kashiwa. (in Japanese)
- Chigira, M., Nakano, M., Tsuchiya, T. and Suzuki, T. 2015. Common characteristics of sequence and cone-penetration profiles in pyroclastic fall deposits that slid during earthquakes. Disaster Prevention Research Institute, Kyoto University Annual Meeting 2014, February, Uji. (in Japanese)
- Tobita, T., Wang, G., Suzuki, T. and Chigira, M. 2015. Mechanical properties of the Halloysite-rich clay obtained from collapsible landslides. Disaster Prevention Research Institute, Kyoto University Annual Meeting 2014, February, Uji. (in Japanese)

- Shirai, M., Omura, A., Hayashizaki, R. and Utsugawa, T. 2014. A possibility of influence of deposition in dam-lake to deep marine environments around the Japanese Islands. *Abstracts of Japan Geoscience Union Meeting 2014*: HQR23-P08, May, Yokohama. (in Japanese with English abstract)
- Shirai, M. and Watanabe, M. 2014. An influence of roadway on occurrence of slope collapse and debris flow of the Izu-Oshima Typhoon Wipha (1326) disaster. *Abstracts of Japan Geoscience Union Meeting 2014*: HSC25-12, May, Yokohama. (in Japanese with English abstract)
- Shirai, M., Omura, A., Hayashizaki, R. and Utsugawa, T. 2014. Mass accumulation rate of hemipelagic environment during the 20<sup>th</sup> century around central Japan: A possibility of influence of dam reservoir deposition. *Abstracts of the 19th International Sedimentological Congress*: 627 (T2S3-P19), August, Geneva.
- Shirai, M., Omura, A., Hayashizaki, R. and Utsugawa, T. 2014. Change in Mass Accumulation Rate during the latter 20th century off the Niigata, central Japan. *Programme and Abstracts, Japan Association for Quaternary Research* **44**: 168, September, Kashiwa. (in Japanese)
- Omura, A., Ikehara, K., Katayama, H., Usami, K., Irino, T., Kuwae, M., Shirai, M. and Ashi, J. 2014. Stratigraphic variations of terrigenous organic carbon ratios in flood and slope failure sediments of marine area, examples from the modern natural disasters of Japan. *Abstracts of the 19th International Sedimentological Congress*: 534 (T2S3-P14), August, Geneva.
- Tamura, I., Yamazaki, H. and Mizuno, K., 2014. The age of the Inubo Group in the Choshi district, Chiba Prefecture, Japan, based on the tephra correlation. *Abstracts of Japan Geoscience Union Meeting 2014*: HQR24-04. May, Yokohama. (in Japanese with English abstract)
- Tamura, I., Mori, Y., Tanaka, S., Usami, T., Tsumura, Y. and Nakagawa, R. 2014. The correlation on Plio-Pleistocene boundary in the Tokai Group in the Kameyama area, Mie Prefecture. *Programme and Abstracts, Japan Association for Quaternary Research* **44**: 7, September, Kashiwa. (in Japanese)
- Tamura, I. 2014. The Tanzawa-garnet pumice : widely distributed 2.5Ma tephra in the southern Kanto area, Japan. The 168st Meeting of Shonan Geology. November, Sagami-hara. (in Japanese)
- Ueki, T. 2014. Chronology of the Miyoshi Formation, eastern Aichi Prefecture, central Japan, based on paleomagnetic polarity. *Programme and Abstracts, Japan Association for Quaternary Research* **44**: 34, September, Kashiwa. (in Japanese)
- Ueki, T. 2015. Fluvial terraces along the upper reach of Miya River, Mie Prefecture, southwest Japan. *Proceedings of the General Meeting of the Japanese Geographers* **87**: 132, March, Setagaya. (in Japanese)
- Oishi, M., Nishiki, K., Furukawa, R., Geshi, N., Oikawa, T. and Ishizuka, Y. 2014. Estimation of eruptive mass from Showa crater, Sakurajima volcano, based on the real-time volcanic ash survey. The meeting of the Risho Geographical association 2014, June, Kumagaya. (in Japanese)
- Oishi, M. and Geshi, N. 2014. Estimation of significance for the proportion of vesiculated glassy particles in the volcanic ash. *Programme and Abstracts, Japan Association for Quaternary Research* **44**: 5, September, Kashiwa. (in Japanese)
- Oishi, M. and Geshi, N. 2014. Time series of particle componentry of volcanic ash from recent eruption at Showa crater, Sakurajima volcano, Japan. *Programme and Abstracts, the Volcanological Society of Japan 2014 fall meeting*: 102, November, Fukuoka. (in Japanese)
- Takahashi, K., Matsushima, N., Takakura, S., Yamaya, Y., Arita, S., Nagamachi, S., Oishi, M., Kazahaya, R. and Fujii, I. 2014. Preliminary result of resistivity modeling around Pommachineshiri crater at Meakandake Volcano, Japan. *Abstracts of Japan Geoscience Union Meeting 2014*: SVC55-P02, May, Yokohama. (in Japanese with English abstract)
- Furukawa, R., Yamamoto, T., Ishizuka, Y., Nanayama, F., Geshi, N., Oikawa, T. and Oishi, M. 2014. Characterization of ash fall particle from the vulcanian eruption of Sakurajima volcano. *Programme and Abstracts, the Volcanological Society of Japan 2014 fall meeting*: 101, November, Fukuoka. (in Japanese)

- Matsushima, N., Takakura, S., Kanda, W., Saito, E. and Oishi, M. 2014. Hydrothermal system at Satsuma-Iwojima volcano, inferred from thermal and electromagnetic observation. *Programme and Abstracts, the Volcanological Society of Japan 2014 fall meeting*: 78, November, Fukuoka. (in Japanese)
- Ando, K. 2014. The reproductive experiments of stratum deformation on the trench for the Kushibiki fault using numerical experiments. *Abstracts of Japan Geoscience Union Meeting 2014*: SSS34-10, April, Yokohama. (in Japanese with English abstract)
- Ando, K. 2015. Numerical calculation of development of a surface rupture associated with 1999 ChiChi earthquake in Taiwan: a case study of a trench log at the Earthquake Museum. *Abstracts Hokudan 2015 International Symposium on Active Faulting*: 88, January, Awaji.
- Hayashizaki, R. and Shirai, M. 2014. Bleaching of K-feldspar grains contained in the tsunami deposits of the 2011 off the Pacific coast of Tohoku Tsunami. *Abstracts of Japan Geoscience Union Meeting 2014*: MIS023-P01, May, Yokohama. (in Japanese with English abstract)
- Hayashizaki, R. and Shirai, M. 2014. Effectiveness of Optically Stimulated Luminescence dating for estimating accurate depositional age of tsunami deposits. *Programme and Abstracts, Japan Association for Quaternary Research* **44**: 74, September, Kashiwa. (in Japanese)
- Hayashizaki, R. and Suzuki, T. 2015. OSL dating of alluvial fan deposits, western Tokyo, Japan. *Proceedings of the General Meeting of the Association of Japanese Geographers 2015 Spring Meeting* **86**: 276, March, Setagaya. (in Japanese)
- Kasahara, A., Suzuki, T., Kitamura, A. and Kato, S. 2014. Late Quaternary tephra and basin fill sediments under northeast part of Yonezawa basin, Northeast Japan. *Abstracts of Japan Geoscience Union Meeting 2014*: HQR24-03, May, Yokohama. (in Japanese with English abstract)
- Nishizawa, F. and Suzuki, T. 2014. Petrographic and chemical properties of Quaternary pyroclastic flow deposits in the Futami Basin, West-central Kyushu, Japan. *Programme and Abstracts, Japan Association for Quaternary Research* **44**: 3, September, Kashiwa. (in Japanese)
- Utsugawa, T. and Shirai, M. 2014. Causes of gravel-sand distribution in upstream part of the river revealed from changes in lithology and form of detritus. *Abstracts of Japan Geoscience Union Meeting 2014*: HGM22-O5, May, Yokohama. (in Japanese with English abstract)
- Utsugawa, T. and Shirai, M. 2014. Fluvial sand grain producing process revealed from changes in lithology and roundness of gravel and sand in the watershed of Watarase River, central Japan. *Abstracts of the 19th International Sedimentological Congress*: 705 (S28\_P10), August, Geneva.
- Utsugawa, Toru, Utsugawa, Takako and Hoshi, Y. 2015. Soil-Geomorphology of Ogasawara Islands, Hahajima - Minerals and Animal Opal in pyroclastic material-. *Abstracts of the annual meeting of Japanese Pedology Society 2015*: 29, March, Tokyo. (in Japanese)
- Takahashi, T. and Shirai, M. 2014. Difference of fluvial terrace sediments between glacial/inter-glacial estimated from size and roundness of gravels: a case study on Tama River terraces. *Programme and Abstracts, Japan Association for Quaternary Research* **44**: 153, September, Kashiwa. (in Japanese)
- Teraguchi, K., Suzuki, T. and Nakayama, T. 2014. Chronology of Kaneko and Tokorozawa fluvial terraces using cryptotephra, Kanto Plain, Japan. *Programme and Abstracts, Japan Association for Quaternary Research* **44**: 181, September, Kashiwa. (in Japanese)
- Teraguchi, K. and Suzuki, T. 2015. Middle Pleistocene fluvial terrace and reconsideration of the activity of Tachikawa fault zone, Musashino upland, central Japan. *Proceedings of the General Meeting of the Association of Japanese Geographers 2015 Spring Meeting* **87**: 126, March, Setagaya. (in Japanese)
- Nakajima, E. and Suzuki, T. Reconstruction of paleogeography of Kanto district about 1.6 Ma based on tephrostratigraphy. *Abstract of Japan Geoscience Union Meeting 2014*: SGL44-09, May, Yokohama. (in Japanese with English abstract)



- Nanri, S. and Suzuki, T. 2014. Pumice deposits of the pre-Ofunato stage distributed in northwest of the Miyake-jima volcano, northern Izu-Bonin Arc. *Abstracts of Japan Geoscience Union Meeting 2014: SVC54-07*, May, Yokohama. (in Japanese with English abstract)
- Nanri, S. 2014. The importance of field work in geology: geological survey in Miyake-jima, Izu Islands. The 4th Asama graduate students seminar, May, Komoro. (in Japanese)
- Nanri, S. 2014. What is "soil"? Origins of the earth surface understood from the soil science and geology: for "the Project for children in summer vacation". Keisen University study session, July, Tama. (in Japanese)
- Mukaiyama, C. and Suzuki, T. 2014. Volcanic products of Haruna Volcano and the position of the Tone River during 6th Century in the Kanto Plain, Japan. *Programme and Abstracts, Japan Association for Quaternary Research* **44**: 184, September, Kashiwa. (in Japanese)

## 2. Laboratory of Climatology

### 1) Staff

Jun MATSUMOTO                      Professor / D. Sc  
Monsoon Climatology, Environmental Climatology

Hideo TAKAHASHI                  Professor / D.Sc.  
Urban Climatology, Climatic Change, Rainfall Climatology

Hiroshi TAKAHASHI                Assistant Professor / PhD (D.Sc.)  
Climate System Study, Cloud-Precipitation Climatology, Regional Climate Modeling

### 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 FY2014

#### *Peer-reviewed Articles*

Chen, T. C., Tsay, J. D., Matsumoto, J. and Alpert, J. 2015. Development and formation mechanism of the Southeast Asian winter heavy rainfall events around the South China Sea. Part I: Formation and propagation of cold surge vortex. *Journal of Climate* **28**: 1417-1443.

Chen, T. C., Tsay, J. D., and Matsumoto, J. 2015. Development and formation mechanism of the Southeast Asian winter heavy rainfall events around the South China Sea. Part II: Multiple interactions. *Journal of Climate* **28**: 1444-1464.

Takahashi, H., Shimizu, S., Yamato, H., Seto, Y. and Yokoyama, H. 2014. Wintertime nocturnal temperature distribution based on spatially high density observation data in the Tokyo metropolitan area under clear sky and weak wind conditions. *Journal of Geography (Chigaku Zasshi)* **123**: 189-210, doi:10.5026/jgeography.123.189. (in Japanese with English abstract)

Suzuki, H., Oshima, R, Nakakita, E. and Takahashi, H. 2015. A study on evaluation method for capture performance of heavy rainfall by rain gauges and reexamination method of charge section of rain gauge. *Annual Journal of Hydraulic Engineering* **59** (CD-ROM). (in Japanese with English abstract)

Takahashi, K. and Takahashi, H. 2014. Influence of urban heat island phenomenon in the central Tokyo on nocturnal

- local wind system in summer (continued study): Relationship between stagnation or passage of local wind front and atmospheric pressure field in surroundings. *Tenki* **61**: 525-540. (in Japanese with English abstract)
- Takahashi, H.G., and H. Fujinami, T. Yasunari, J. Matsumoto and S. Baimoung, 2015. Role of tropical cyclones along the monsoon trough in the 2011 Thai flood and interannual variability. *Journal of Climate*, **28**, 1465-1476.
- Fujita, M., Takahashi, H. G., Ishizaki, N. N. and Kimura, F. 2014. Long-term variation of winter precipitation linked to sea-surface heat fluxes around the Japan Sea. *Atmosph. Sci. Lett.*, **15**: 275-281.
- Inatsu, M., Sato, T., Yamada, T., Kuno, R., Sugimoto, S., Farukh, A. M., Pokhrel, N. Y. and Kure S. 2015. Multi-GCM by Multi-RAM experiments for dynamical downscaling on summertime climate change in Hokkaido. *Atmos. Sci. Lett.*, doi: 10.1002/asl2.557.
- Matsumura S., Sugimoto S. and Sato S. 2015. Recent intensification of the western Pacific subtropical high associated with East Asian summer monsoon. *Journal of Climate.*, doi:10.1175/JCLI-D-14-00569..
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- Yamaji, M. and Takahashi, H.G. 2014. Asymmetrical interannual variation in aerosol optical depth over the tropics in terms of aerosol-cloud interaction. *Abstracts of the Meteorological Society of Japan 2014 Autumn Meeting* **106**: 240, October, Fukuoka. (in Japanese)
- Yokoyama, T., Takahashi, H.G. and Sugimoto, S. 2014. Statistical study of convective activity occurred and moved eastward over the Tibetan Plateau. *Abstracts of the Meteorological Society of Japan 2014 Autumn Meeting* **106**: 242, October, Fukuoka. (in Japanese)
- Miyaji, Y. 2015. The mechanism of winter SST variability over the East China Sea. *The 63rd Meeting of Graduation Thesis of Geography 2014*, March, Koganei. (in Japanese)

### 3. Laboratory of Environmental Geography

Makiko WATANABE                      Professor / PhD  
Soil Geography, Environmental Dynamic Analysis, Geoarcheology

Masayuki KAWAHIGASHI              Associate Professor / Dc. Agr.  
Soil Ecology, Environmental Chemistry, Material Dynamics in Ecosystems

#### Overview of Research Activities

This research unit studies processes enacted upon human and natural environment in local and regional scales, with interdisciplinary fields comprised of physical geography, environmental chemistry, forest ecology, soil science, anthropology and so on. Research methods are in primary based on fieldworks associated with laboratory analyses of soil, water, plant and other environmental samples collected, interview survey, aerial photo and satellite imagery interpretation as well. Evaluation of urban soils as environmental resources is one of our major research subject together with overseas field studies. Recent research subjects are as follows;

1. Development of survey methods for evaluation of soils in urban area
2. Characterization of sclerotium grains and their function in forest soil ecosystem
3. Geoarcheological study on ancient water environment of Kharga, Western Desert, Egypt
4. Environmental dynamics study of watershed area of SWIP dam in central Luzon, Philippines
5. Influence of anthropic pressure in a river basin on downstream water environment
6. Evaluation of forest fire impact on soil, vegetation and landform in terrestrial ecosystems
7. Study for carbon and nitrogen dynamics in urban ecosystems
8. Soil carbon sequestration from the point of view of soil parent materials

#### 3) List of Research Activities in FY2014

##### *Peer-reviewed Articles*

- Watanabe, M., Sugimura T., Kamei H. 2014. Interpretation of characteristics of the land use change based on chronological satellite imageries of Kharga Oasis, Western Desert, Egypt. *Journal of Japan Remote Sensing Society* **34**: 356-366. (in Japanese with English abstract)
- Alidoust, D., Kawahigashi, M., Yoshizawa, S., Sumida, H., Watanabe, M. 2015. Mechanism of cadmium biosorption from aqueous solutions using calcined oyster shells. *Journal of Environmental Management* **150**: 103-110.
- Amasya, A. F., Narisawa, K., Watanabe, M. 2015. Analysis of sclerotia-associated fungal communities in cool-temperate forest soils of north Japan. *Microbes and Environments* **30**: <http://dx.doi.org/10.1264/jsme2.ME14135>
- Diene, O., Sakagami, N., Narisawa, K. 2014. The role of dark septate endophytic fungal isolates in the accumulation of Cesium by Chinese cabbage and tomato plants under contaminated environments. *PLoS ONE* **9**: e109233. doi:10.1371/journal.pone.0109233

##### *Other Articles*

- Inubushi, K., Nagano, H., Kawashigashi, M., Prikhodko, V. E. 2014. Forms of the carbon and nitrogen and greenhouse gases emission of the soils *In Arkaim: the Bronze Age fortified settlement of the steppe Trans-Ural* pp196-207, soil-archaeological research the Academic Council of IPBPSS RAS, Moscow. (in Russian with English abstract)

### **Books**

None

### **Reports**

Sato, T., Sakagami, N. 2014. Case report of field work program in Indonesia (FY2011). *Journal of International Cooperation for Agricultural Development* **13**, 81–84. (in Japanese)

### **Book Reviews**

None

### **Miscellaneous Reports**

Morishita, M. 2015. A report on the workshop of geomorphology and Quaternary geology for pedologists. *Pedologist*, **58**: 120-121. (in Japanese)

### **Presentations**

Watanabe, M., Miyajima, S., Osato, Y. 2014. Characteristics of heat and water transfer in man-made soils in urban area. *In* Technogenic soils developed on settlements, soil formation, properties and utilization. Japanese Society of Soil Science and Plant Nutrition **60**: September, Tokyo.

Watanabe, M., Miyajima, S., Osato, Y. 2014. Characteristics of heat and water transfer in man-made soils in urban area. Kenkyukan, Tokyo Metropolitan University. September, Hachioji, Tokyo.

Watanabe, M., Koizumi, N., Kato, S., Kikuchi, R., Kamei, H. 2014. Characterization of magnetic spherical fractions in sand deposits for interpretation of environmental change around the El-Zayyan temple, Kharga Oasis, Western Desert, Egypt. European Geosciences Union General Assembly 2014, May, Vienna, Austria.

Amasya, A., Narisawa, K., Watanabe, M. 2014. Fungal community in sclerotia of Japanese beech forest soils in northern Japan. European Geosciences Union General Assembly 2014, May, Vienna, Austria.

Hardenbicker, U., Watanabe, M., Kotowitch, R. 2014. Product Index as an indicator of weathering within an alluvial fan profile. The 38th annual conference of the Prairie Division of the Canadian Association of Geographers (CAG), September, Manitoba, Canada.

Kawahigashi, M., Prokushkin, A., Sumida H. 2014. Heating effects on biodegradation of organic horizons under larch forest in the Siberian taiga forest. World Congress of Soil Science, June, Jeju, Korea.

Kawahigashi, M. 2014. Dynamics of organic matter in soil. *In* Past and future for research on natural organic matter in environment. Japanese Humic Substances Society: 15-16, November, Kanagawa. (in Japanese)

Kawahigashi, M., Kida, K. 2014. Elemental dynamics in subsurface soils beneath road construction covered with asphalt pavement, special remarks on carbon dynamics. Japanese Society of Soil Science and Plant Nutrition **60**: 215, September, Tokyo. (in Japanese)

Kida, K., Kawahigashi, M. 2014. Influence of asphalt pavement on major element forms in subgrade soils. 20th World Congress of Soil Science, June, Jeju, Korea.

Kida, K., Kawahigashi, M. 2015. Characterization of soils beneath pavements increase in urbanization. Proceedings of the General Meeting of the Association of Japanese Geographers 2015 Spring Meeting **87**: 144, March, Tokyo. (in Japanese)

Morishita, M., Kawahigashi, M. 2014. Degradation processes of buried peat distributing the Sagamino Plain with special attention on chemical structural analysis. Japanese Society of Quaternary Research: **67**, September, Chiba. (in Japanese)

Watanabe, M., Mario, C., Morishima, W., Watanabe, M. 2015. Relations of the mango tree growth and soil properties in the hilly area in Central-Luzon, The Philippines. Proceedings of the General Meeting of the Association of Japanese

- Geographers 2015 Spring Meeting **87**: 75, March, Tokyo. (in Japanese)
- Matsudaira, H., Morishita, M., Miyajima, S., Kida, K., Osato, Y., Watanabe, M., Kawahigashi, M. 2015. Pedogenesis on soils beneath tree plantation in the urban greenery area "Umi-no-mori". Japanese Society of Pedology: 13, March, Tokyo. (in Japanese)
- Shirai, M., Watanabe, M., Tokyo Metropolitan University, Disaster Survey Group for the Izu-Oshima Typhoon Wipha (1326) 2014. An influence of roadway on occurrence of slope failure and debris flow of the Izu-Oshima Typhoon Wipha (1326) disaster. Japan Planetary Geoscience Union 2014 Assembly May, Makuhari. (in Japanese)
- Shiotsu, F. Sakagami, N., Nurwulan, A., Asagi, N., Dewa, N.S., Komatsuzaki, M., Nitta, Y. 2014. Rice preference in Indonesia -From the view point of rice quality and palatability. 6th Annual Meeting of Japan Society for Rice Quality and Palatability, November, Kyoto. (in Japanese)
- Myoga, S. 2014. Research on loss of land function of Watarase riverbed. Proceedings of the General Meeting of the Association of Japanese Geographers 2014 Autumn Meeting **86**: 169, October, 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, Numerical Meteorological Modelling

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 and local wind
6. Capturing surface conditions of cities using GIS
7. Monitoring and modeling natural environment and natural hazards

### 3) List of Research Activities in FY2014

#### *Peer-reviewed Articles*

Matsuyama, H. 2014. How do local residents perceive strong local wind "Matsubori-kaze"?—(2) Analysis of written descriptions of students' impressions at Ozu-Higashi Elementary School—. *Journal of Geography (Chigaku Zasshi)* **123**: 378-387 (in Japanese with English abstract).

Sakamoto, M., Inamura, T., Izumi, T. and Matsuyama, H. 2014. An observational study on the blowing extent and mechanism of "Matsubori-kaze" based on *in situ* observations and meso-scale meteorological model. *Tenki* **61**: 977-996 (in Japanese).

Saito, H., Korup, O., Uchida, T., Hayashi, S. and Oguchi, T. 2014. Rainfall conditions, typhoon frequency, and contemporary landslide erosion in Japan. *Geology* **42**: 999-1002.

Korup, O., Hayakawa, Y. S., Codilean, A., Matsushi, Y., Saito, H., Oguchi, T. and Matsuzaki, H. 2014. Japan's sediment flux to the Pacific Ocean revisited. *Earth-Science Reviews* **135**: 1-16.

Obanawa, H., Hayakawa, Y. S., Saito, H. and Gomez, C. 2014. Comparison of DSMs derived from UAV-SfM method

and terrestrial laser scanning. *Journal of the Japan Society of Photogrammetry and Remote Sensing* **53**: 67-74 (in Japanese with English abstract).

Yamanaka, M., Bottrell, S.H., Wu, J., Kumagai, Y., Mori, K. and Satake, H. 2014. Chlorine stable isotope evidence for salinization processes of confined groundwater in southwestern Nobi Plain aquifer system, central Japan. *Journal of Hydrology* **519A**: 295-306.

### **Other Articles**

Matsuyama, H. 2014. 2.1.6 Groundwater and soil in Hachioji, 2.1.7. Rivers in Hachioji, 2.3.6 On the acid rain. In *New History of Hachioji City, Version of Natural Environment*, ed. Editorial Board of History of Hachioji City, Tokyo: Hachioji city, 59-73, 166-168 (in Japanese).

Matsuyama, H. 2014. 1. Mutually-linked natural environment in Southeast Asia and Oceania. In *Southeast Asia and Oceania*, ed. T. Kikuchi and H. Oda, Tokyo: Asakura-shoten, 1-16 (in Japanese).

Matsuyama, H. 2014. Column 9. The effect of global warming in Tuvalu. In *Southeast Asia and Oceania*, ed. T. Kikuchi and H. Oda, Tokyo: Asakura-shoten, 149 (in Japanese).

Matsuyama, H. 2015. 12. Natural tourism and disasters—Some hints on the risk management of natural disasters—. In *Natural Tourism*, ed. T. Kikuchi and T. Arima, Tokyo: Asakura-shoten, 123-133 (in Japanese).

Matsushi, Y., Saito, H. and Doshida, S. 2014. Topographic analysis of mass movements based on GIS. In *Measure Technology of Landslides—Mechanism, Sensing, Monitoring System and New Construction Method—*, ed. Shinnihon Printing Inc., Tokyo: NTS, 96-105 (in Japanese).

Mita, A., Oyagi, H. and Mori, K. 2015. Temporal changes in chemical characteristics of rain water attendant upon the duration of rainfall—A case study in the Greater Tokyo Metropolitan Area—. *Proceedings of the Institute of Natural Sciences, Nihon University* **50**: 115-123 (in Japanese).

### **Books**

Matsuyama, H., Kawase, K., Tsujimura, M., Takaoka, S. and Miura, H. 2014. *Physical Geography*. Kyoto: Minerva-shobou, 308p (in Japanese).

Mori, K. and Sato, Y. 2015. *Lakes in Japan: An Illustrated Interpretation*. Tokyo: Asakura-shoten, 164p (in Japanese).

### **Reports**

Matsuyama, H. 2014. Relationship between surface geometric structure of vegetation and bi-directional reflectance distribution function. *Annual Report 2013 of Center for Environmental Remote Sensing, Chiba University* **19**: 53-55 (in Japanese and English).

Matsuyama, H. 2014. A diagnostic study on the interannual variations of spring waters, ground waters, and land use in Tokyo along with their future projections. *Reports of Grant-Supported Research Fundings, The Asahi Glass Foundation* (2014): 50-51 and CD-ROM (in Japanese with English abstract).

Saito, H. and Matsuyama, H. 2014. Operation and application of monitoring system of heavy rainfall and landslide hazards for disaster prevention information based on long-term data analysis. *Report of Grant-Supported Research Fund, Japan Geographic Data Center*: 22p (in Japanese).

### **Book Reviews**

Matsuyama, H. 2014. Book Review (Okai, T.: Professor of the University of Tokyo). *Chiri* **59**(9): 95 (in Japanese).

Matsuyama, H. 2015. Book Review (Shiino, W. and Shiraishi, S. (ed.): Entering the Field. Million Fieldworkers' Series Vol.1). *Chiri* **60**(3): 114 (in Japanese).

Mori, K. 2014. Book Review (The Tokai Branch, the Japanese Society of Limnology (ed.): Environmental Science on Inland Water Familiar to our Vicinity [Volume on Practical Training and Investigation]—To Examine the Structure of

- Physical Realm—). *Journal of Japanese Association of Hydrological Sciences* **44**: 225-226 (in Japanese).
- Nemoto, Y. 2014. Book review (Takeuchi, M.: Tokyo no History Walk and Enjoy Color Version Map). *Chizu Joho* **34**(3): 22 (in Japanese).

### **Miscellaneous Reports**

- Matsuyama, H. 2014. A visit to villages located in the natural levee formed by Iwaki River, Aomori prefecture. *Chiri Geppo* No.538: 0-3 (in Japanese).
- Matsuyama, H. (Comment) 2014. Landslides in Hiroshima—Warning as pointed out in 15 years ago—. *Asahi Shimbun Weekly AERA* **27**(37): 67 (in Japanese).
- Matsuyama, H. and Izumi, T. 2014. Field work in physical geography—(7) Another episodes on "Fortunate coincidence and good intuition". *Chiri* **59**(5): 74-79 (in Japanese).
- Nakaegawa, T., Ishida, S., Kazama, S., Tachikawa, Y., Tanakamaru, H., Nakayama, K., Matsuyama, H., Murakami, S., Yamanaka, T., Yokoo, Y. and Lu, M. 2014. Current status of Hydrological Research Letters as of 2014. *Journal of Japan Society of Hydrology and Water Resources* **27**: 320-324 (in Japanese).
- Izumi, T. 2014. Session E-7: Data production (2). *GISA News Letter* No.92: 12-13 (in Japanese).
- Aoyama, M. 2014. Creation of inventories concerning liquefaction damage in inland area caused by the 2011 off the Pacific coast of Tohoku Earthquake. *Journal of Geography (Chigaku Zasshi)* **123**: N134 (in Japanese).
- Nemoto, Y. 2014. The artificial flooding tactics at Bichutamats castle by Hideyoshi as revealed by flood-inundation simulations. *GIS NEXT* No. 47: 82 (in Japanese).
- Nemoto, Y. 2014. What we have learned and acquired at Tokyo Metropolitan University are directly usable after graduation. *University Guide of Tokyo Metropolitan University 2015*: 37 (in Japanese).
- Sakai, K., Hasegawa, K., Izumi, T. and Matsuyama, H. 2014. Configuration of BRDF observation system using newly-developed unmanned aerial vehicle (UAV). *Proceedings of the 16th CEReS Symposium on Remote Sensing for Environment*: 5-9 (in Japanese).
- (c.f.) Sakamoto, M. 2014. Observational study on the situation and mechanism of "Matsubori-kaze", based on field survey and meso-scale meteorological model. *The New Geography (The Shin-Chiri)* **62**(2): 69 (in Japanese).

### **Presentations**

- Matsuyama, H. 2014. A diagnostic study on the interannual variations of spring waters, ground waters, and land use in Tokyo along with their future projections. *Proceedings of the 2014 Seminar on Grant-Supported Research Fundings, The Asahi Glass Foundation*: 164-165, July, Tokyo (in Japanese).
- Matsuyama, H. 2014. A diagnostic study on the interannual variations of spring waters, ground waters, and land use in Tokyo along with their future projections. *Program of Annual Meeting of Society of Environmental Science, Japan, 2014*: 168-169, September, Tsukuba (in Japanese).
- Matsuyama, H. 2014. Where does water in Tokyo come from?—Tamagawa Josui and surface water in the Tone river systems—. Open University of Tokyo Metropolitan University "Water in Tokyo—Present, past, and future—". November, Iidabashi (in Japanese).
- Matsuyama, H. 2014. Where does water in Tokyo come from?—Long-term variation of spring water temperatures in valley head type and cliff line type—. Open University of Tokyo Metropolitan University "Water in Tokyo—Present, past, and future—". December, Iidabashi (in Japanese).
- Matsuyama, H. 2014. Why characteristics of spring water temperatures are different in Hino city?—An analysis focusing on water temperature and water quality— Open University of Tokyo Metropolitan University "Water in Tokyo—Present, past, and future—". December, Iidabashi (in Japanese).
- Matsuyama, H. 2014. How does the groundwater in Tokyo change in future?—Future projection based on the groundwater simulation—. Open University of Tokyo Metropolitan University "Water in Tokyo—Present, past, and



- future—”. December, Iidabashi (in Japanese).
- Matsuyama, H. 2015. Cubic Earth—If the earth was cubic—. Open Lecture at Ashikaga Super Science Highschool, January, Ashikaga (in Japanese).
- Matsuyama, H. 2015. Professional job talk. Roka Junior High School, Setagaya ward, March, Setagaya (in Japanese).
- Matsuyama, H., Tanaka, D. and Saito, H. 2014. Evaluation of the occurrence of landslides based on 50-year's probability values of Soil Water Index and hourly precipitation. *Proceedings of 2014 Annual Conference, Japan Society of Hydrology and Water Resources*: 136-137, September, Miyazaki (in Japanese).
- Matsuyama, H., Sakai, K., Yamamoto, R., Hasegawa, K. and Izumi, T. 2015. An observational study of BRDF at forests using small-sized UAV in relation to the seasonal variation of their phenology. 17th CEReS Symposium on Environmental Remote Sensing, February, Chiba (in Japanese).
- Nagoshi, T., Mori, A., Kimura, R., Matsuda, Y., Matsuyama, H., Sakai, S., Takahashi, M., Fujita, M. and Torigoe, H. 2014. On practical use as teaching materials of the "Cubic Earth—If the earth was cubic"—Lesson practice through the visiting lecture to elementary and junior high schools—. Annual Meeting of Japan Society of Earth Science Education, August, Ebetsu (in Japanese).
- Izumi, T. 2015. Activities report of “Tokyo Metropolitan University Disaster Investigation & Assistance Special Team by Unmanned Aerial Vehicles” —Future prospects and the forefront of unmanned helicopter operations in disaster areas. The 6th GIS Landslide Workshop: P-5, January, Kashiwa (in Japanese).
- Izumi, T. and Yamamoto, R. 2014. A study on archives of the revival process from the Great East Japan Earthquake disaster using unmanned aerial vehicle and mobile mapping system — A case study in Iwanuma city, Miyagi prefecture—. *Proceedings of International Symposium on GIS by GIS Association of Japan (CD-ROM)*: A-2-1, November, Kasugai.
- Izumi, T., Yamamoto, R. and Osawa, S. 2015. A study on the coastal forest condition using high-resolution images taken by a large UAV and small UAVs imagery archives of the reconstruction process from the Great East Japan Earthquake — A case study in Iwanuma City, Miyagi Pref. —. Tokyo Conference on International Study for Disaster Risk Reduction and Resilience: No.32. January, Tokyo.
- Izumi, T., Yamamoto, R. and Osawa, S. 2014. Investigation of the coastal forest condition with high-resolution images taken by UAV. *23rd Conference of GIS Association of Japan (CD-ROM)*: B-1-5, November, Kasugai (in Japanese).
- Izumi, T., Sakai, K., Yamamoto, R., Izumi, Y., Urita, S., Kasama, T. and Masuda, M. 2014. A study on utilizing small-sized unmanned aerial vehicle during the occurrence of disasters — A case study of the slope failures at Asaminami-ku, Hiroshima city —. *Research Abstracts on Spatial Information Science, CSIS DAYS 2014*: 15, November, Kashiwa (in Japanese).
- Izumi, Y., Yamamoto, R. and Izumi, T. 2015. A study on creating ultra high resolution orthophoto and DSM using small UAVs — A case study in a disaster area by debris flows in Nagiso Town, Nagano Pref. —. Tokyo Conference on International Study for Disaster Risk Reduction and Resilience: No.28. January, Tokyo.
- Yamato, H., Usami, M. and Izumi, T. 2015. A investigation report of the tornado disaster at Houjyo, Tukuba, Ibaragi Pref. by latest small UAVs. Tokyo Conference on International Study for Disaster Risk Reduction and Resilience: No.24. January, Tokyo.
- Omi, H., Sakai, K., Yamamoto, R., Hasagawa, H. and Izumi, T. 2015. A study on creating ultra high resolution orthophoto and DSM using small UAVs — A case study in southern base of the Mt. Yatsugatake in 2014 —. Tokyo Conference on International Study for Disaster Risk Reduction and Resilience: No.25. January, Tokyo.
- Mito, T., Izumi, T. and Matsuyama, H. 2014. Relationship between the location of wind farm and amount of power generation as revealed by observed data at 6 power plants situated at coasts, hills, and mountains in Japan. *Abstracts of the Meteorological Society of Japan 2014 Spring Meeting* **105**: 397, May, Yokohama (in Japanese).
- Osawa, S., Nanami, E., Izumi, T. and Ishikawa, M. 2014. A study on distinguishing tree types using high-resolution images of the coastal forest at the southern part of Sendai plain, damaged by Great East Japan Earthquake disaster.

- General Meeting of the Association of Rural Planning 2014 Spring Meeting, April, Tokyo (in Japanese).
- Shimojo, M., Izumi, T. and Matsuyama, H. 2014. Diagnostic study on heavy snowfall event in the southern Kanto district on 14th January 2013 by focusing on the distribution of accumulated snow. *Abstracts of the Meteorological Society of Japan 2014 Spring Meeting* **105**: 369, May, Yokohama (in Japanese).
- Aoyama, M. 2014. Liquefaction occurrence ratio and geomorphic conditions in the inland area caused by the Great East Japan Earthquake. *Abstract of Japan Geoscience Union Meeting 2014*: HSC25-P06, April, Yokohama (in Japanese with English abstract).
- Aoyama, M. and Koyama, T. 2015. Correlation between liquefaction areas in Kamisu and Kashima cities caused by the 2011 off the Pacific coast of Tohoku Earthquake and the time-series changes of distribution of gravel pits. *Proceedings of the General Meeting of the Association of Japanese Geographers 2015 Spring Meeting* **87**: 138, March, Setagaya (in Japanese).
- Aoyama, M., Kobori, N. and Kawano, K. 2014. Identify the building demolished area in Kamaishi and Handa Cities using U.S.military aerial photographs. *Proceedings of the 2014 Annual General Meeting of Japan Cartographers Association*: 46-47, August, Sendai (in Japanese).
- Saito, H. 2015. Application of geographic information system (GIS) for regional analysis of landslides. *Proceedings of the General Meeting of the Association of Japanese Geographers 2015 Spring Meeting* **87**: 25, March, Setagaya (in Japanese).
- Saito, H., Murakami, W. and Daimaru, H. 2014. Recurrence intervals and rainfall intensity-duration thresholds for extensive shallow landslide occurrence in granitic mountains of Japan. *EGU General Assembly 2014*: EGU2014-4753, April, Vienna, Austria.
- Saito, H., Korup, O., Uchida, T., Hayashi, S. and Oguchi, T. 2014. Rainfall conditions, typhoon frequency, and contemporary landslide erosion in Japan. *Abstracts of the Asia Oceania Geosciences Society (AOGS) 11th Annual Meeting*: SE05-A005, July, Sapporo.
- Saito, H., Murakami, W., Daimaru, H. and Oguchi, T. 2014. Rainfall intensity-duration thresholds and recurrence intervals for shallow landslide occurrences in Mt. Ichifusa and the Abukuma Mountains. *Proceedings of the General Meeting of the Association of Japanese Geographers 2014 Fall Meeting* **86**: 167, September, Toyama (in Japanese).
- Saito, H., Uchiyama, S., Hayakawa, Y., Obanawa, H., Izumi, T., Yamamoto, R. and Matsuyama, H. 2014. Analysis of landslide occurrences and topographic changes around Mt. Aso using high definition data. *Research Abstracts on Spatial Information Science, CSIS DAYS 2014*: 13, November, Kashiwa (in Japanese).
- Saito, H., Murakami, W., Daimaru, H., and Oguchi, T. 2014. Relationship between the occurrence of shallow landslides on granite mountains and the recurrence intervals of heavy rainfall — A case study at Mt. Ichifusa and the Abukuma Mountains —. *Utilization Forests under Climate Change*: T-05, November, Tokyo (in Japanese).
- Saito, H., Murakami, W., Daimaru, H. and Oguchi, T. 2015. Rainfall intensity-duration thresholds and recurrence intervals for landslide occurrences in granitic mountains, Japan. *Tokyo Conference on International Study for Disaster Risk Reduction and Resilience*: No.06, January, Tokyo.
- Saito, H., Uchiyama, S., Obanawa, H., Hayakawa, Y., Izumi, T., Yamamoto, R. and Matsuyama, H. 2015. Acquisition and Application of low altitude aerial photographs for topographic analysis of shallow landslides around Mt. Aso. *The 6th GIS Landslide Workshop*: M-5, January, Kashiwa (in Japanese).
- Saito, H., Obanawa, H., Uchiyama, S., Hayakawa, Y., Izumi, T., Yamamoto, R. and Matsuyama, H. 2015. Analysis of landslide occurrences and topographic changes using UAVs and SfM-MVS. 17th CEReS Symposium on Environmental Remote Sensing, February, Chiba (in Japanese).
- Saito, H., Uchiyama, S., Obanawa, H., Hayakawa, Y., Izumi, T., Yamamoto, R. and Matsuyama, H. 2015. Application of high definition data for topographic analysis using UAVs and SfM photogrammetry — A case study of shallow landslides around Mt. Aso —. *Proceedings of the General Meeting of the Association of Japanese Geographers 2015 Spring Meeting* **87**: 274, March, Setagaya (in Japanese).

- Gomez, C., Obanawa, H., Kato, A., Hayakawa, Y. and Saito, H. 2014. Structure from motion for pointclouds creation from historical imagery and UAV: Monitoring floodplain vegetation evolution in 3D. 5th Digital Earth Summit 2014, November, Nagoya.
- Hayakawa, Y. S., Obanawa, H., Wassmer, P., Oguchi, T. and Saito, H. 2014. Morphological analysis of an uplifted coastal terrace using high definition topographic data: Possible erosion by high waves of tsunamis. *2014 GSA Annual Meeting*: 34-8, October, Vancouver, Canada.
- Iijima, Y., Saito, H. and Fedorov, A. N. 2015. Statistical characteristics on distribution of thermokarst lakes in the central Lena River basin, eastern Siberia. *Proceedings of the General Meeting of the Association of Japanese Geographers 2015 Spring Meeting* **87**: 289, March, Setagaya (in Japanese).
- Kariya, Y., Matsushi, Y., Takaoka, S., Nishii, R., Saito, H., Sato, G. and Harayama, S. 2015. Recent advances in geological and geomorphological studies on large-scale landslides in the Japanese Alps. *Proceedings of the General Meeting of the Association of Japanese Geographers 2015 Spring Meeting* **87**: 282, March, Setagaya (in Japanese).
- Murakami, W., Saito, H. and Daimaru, H. 2014. Relationship between landslide occurrences and clear-cuttings around Mt. Ichifusa, Kyushu. *Utilization Forests under Climate Change*: T-04, November, Tokyo (in Japanese).
- Tanaka, D., Saito, H. and Matsuyama, H. 2014. Analysis of heavy rainfall events such as heavy rainfall of northern part of Kyushu in 2012 with the use of the snake line — Application of probability values of 50 years —. *Abstracts of the Meteorological Society of Japan 2014 Spring Meeting* **105**: 374, May, Yokohama (in Japanese).
- Mori, K. 2014. Impacts of recent changes in hydrometeorological component on water sustainability: A case of mesoscale watershed under the humid temperate climate (Keynote Lecture). *International Scientific Conference on "Water Sustainability: New Challenges and Solutions", Commission for Water Sustainability, International Geographical Union*: 30, August, Dubrovnik, Croatia.
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- Mori, K. 2014. Secular changes in hydrometeorological factors taking notice of river water quality under the unusual weather. *Proceedings of the General Meeting of the Association of Japanese Geographers 2014 Fall Meeting* **86**: 154, September, Toyama (in Japanese).
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- Yamamoto, R., Izumi, Y. and Izumi, T. 2015. An investigation report of landslides at Nagiso town, Nagano prefecture using a small UAV. *The 6th GIS Landslide Workshop*: P-6, January, Kashiwa (in Japanese).
- Hisatomi, Y., Nakayama, D. and Matsuyama, H. 2014. Diagnostic study on shallow groundwater flow in Musashino Terrace as simulated by MODFLOW using outputs of 4 GCMs. *Abstracts of the Meteorological Society of Japan 2014 Spring Meeting* **105**: 358, May, Yokohama (in Japanese).
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## 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.)  
Geopoetics, Francophone Studies

Hiroyuki TSUBOMOTO                Assistant Professor / PhD (D.Sc.)  
Urban Geography, Office Study

Michiko HARAYAMA                  Assistant Professor  
Bibliometrics

### 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 FY2014

#### *Peer-reviewed Articles*

- Sugiura, Y. 2015. Central place theory and Nazi German planning for reorganizing the central settlement system in incorporated Eastern territories. *Urban Geography of Japan* **10**: 1-33. (in Japanese with English abstract)
- Wakabayashi, Y. and Koizumi, R. 2014. Spatial patterns of population change in the 23 special wards of Tokyo after the

period of the bubble economy. *Journal of Geography (Chigaku Zasshi)*: 123: 249-268. (in Japanese with English abstract)

Tsubomoto, H. 2014. Office location as workspace for white-collar worker in Tokyo central area. *Geographical Sciences (Chiri Kagaku)* **69**(3): 152-163. (in Japanese with English abstract)

Tsubomoto, H. 2015. The transformation of the central business district of Hiroshima city after the bubble economy. *Urban Geography of Japan* **10**: 89-102. (in Japanese with English abstract)

#### **Other Articles**

Sugiura, Y. 2014. History of geography and methodology. *Jimbun Chiri: Japanese Journal of Human Geography* **66**(3): 252-255.

Koizumi, R. and Wakabayashi, Y. 2014. Changes in the Spatial Patterns of Occupational Structure in the Tokyo Metropolitan Area after the Bubble Economy. Singh, R.B. ed.: *Urban Development Challenges, Risks and Resilience in Asian Mega Cities*. Tokyo: Springer 251-366.

Wakabayashi, Y. 2015. Spatial cognition and GIS. Asami, T., Yano, K., Sadahiro, Y. and Yuda, M. eds. *Geographic Information Science: GIS standards*. Tokyo: Kokon Shoin: 16-21. (in Japanese)

Wakabayashi, Y. 2015. Measurement of geospatial thinking abilities and the factors affecting them. *Geographical Reports of Tokyo Metropolitan University* **50**: 127-136.

Abe, C. and Wakabayashi, Y. 2015. Changes in childcare services accompanying municipal mergers: a case study of Kahoku City in Ishikawa Prefecture. *Geographical Reports of Tokyo Metropolitan University* **50**: 89-96.

#### **Books**

OECD ed., translated into Japanese by Nakazawa, T., Kamiya, H., Kubo, T., Kuwatsuka, K., Yui, Y., Kukimoto, M. and Wakabayashi, Y. 2014. *OECD regions at a glance 2013*. Tokyo: Akashi Shoten. (in Japanese)

#### **Reports**

None

#### **Book Reviews**

None

#### **Miscellaneous Reports**

None

#### **Presentations**

Sugiura, Y. 2015. On the work of Dr. Hiroshi Morikawa. Commemorative meeting of Hiroshi Morikawa's 80<sup>th</sup> birthday. March, Tokyo.

Wakabayashi, Y., Koizumi, R., Kukimoto, M. and Yui, Y. 2014. Mapping the supply-demand gap in childcare services with GIS: A case study in Tokyo. *Abstracts Japan Geoscience Union Meeting 2012 (CD-ROM)*, April, Yokohama. (in Japanese)

Wakabayashi, Y., Koizumi, R., Kukimoto, M. and Yui, Y. 2014. Mapping the supply-demand gap in childcare services with GIS: A case study in Koto Ward, Tokyo. *Papers and Proceedings of the Annual Conference of the Japan Cartographers Association*, 28-29, August, Sendai. (in Japanese)

Wakabayashi, Y., Kukimoto, M. and Yui, Y. 2014. Visualization of the supply-demand gap in childcare services with GIS: The case of Naha City, Japan. IGU 2014 Krakow Regional Conference, Krakow, August 2014.

Wakabayashi, Y. 2014. Components and determinants of spatial thinking abilities. *Proceedings of the General Meeting*

- of the Association of Japanese Geographers 2014 Autumn Meeting* **86**: 145, September, Toyama. (in Japanese)
- Abe, C. and Wakabayashi, Y. 2014. The changes in childcare services due to the municipal merger: a case study of Kahoku City, Ishikawa Prefecture. *Proceedings of the General Meeting of the Association of Japanese Geographers 2014 Autumn Meeting* **86**: 97, September, Toyama. (in Japanese)
- Abe, C. and Wakabayashi, Y. 2014. The changes in childcare service due to the municipal merger: A case study of municipalities in Ishikawa Prefecture. 61th Annual Conference of Japan Society for Urbanology, October, Kyoto. (in Japanese)
- Wakabayashi, Y. 2014. Patterns and determinants of the variation in web map use. *Papers and Proceedings of the Geographic Information Systems Association* **23** (CD-ROM), November, Kasugai (in Japanese)
- Wakabayashi, Y. and Koizumi, R. 2014. Detection and mapping of hot/cold spots of urban spatial change in Tokyo Metropolitan Area. Proceedings of the 2014 Annual Meeting of the Human Geographical Society of Japan, November, Higashihiroshima (in Japanese)
- Wakabayashi, Y. 2015. Variation in the use of maps on the web: An empirical analysis of web survey data. The International Symposium on Cartography in Internet and Ubiquitous Environments 2015, March, The University of Tokyo.
- Wakabayashi, Y. 2015. Reconsideration of mental maps: cities and regions in contemporary Japan from a view point of residential preference. Commemorative meeting of Hiroshi Morikawa's 80<sup>th</sup> birthday. March, Tokyo.
- Tsubomoto, H. 2014. A study of spatial transformation of Tokyo CBD after the middle of the 1990s. 61th Annual Conference of Japan Society for Urbanology, October, Kyoto. (in Japanese)
- Saito, A., Okada, D. and Tsubomoto, H. 2015. An interim report of case inspections of office and workplace SOF model. JFMA Forum 2015, February, Tokyo.
- Koizumi, R. 2014. Changing the socio-spatial patterns of the Tokyo metropolitan area after 1990s. Symposium on the Spring Meeting of the Association of Kokushikan Geographers 2014, June, Tokyo. (in Japanese)
- Koizumi, R. and Kawaguchi, T. 2014. The spatial patterns of condominium supplies in central Tokyo in 2000s. *Proceedings of the General Meeting of the Association of Japanese Geographers 2014 Autumn Meeting* **86**: 80, September, Toyama. (in Japanese)
- Araiori, T. 2014. Local spread of epidemic disease of Influenza A(H1N1)pdm 2009. *Proceedings of the General Meeting of the Association of Japanese Geographers 2014 Autumn Meeting* 84:90, September, Toyama. (in Japanese)
- Araiori, T. 2015. Infectious disease prevention, health risk management and geography. The General Meeting of the health geography group of the Association of Japanese Geographers 2015 Spring Meeting, March, Setagaya. (in Japanese)
- Tanaka, M. 2014. Creation of "enabling space" using volunteered geographic information. *Proceedings of the General Meeting of the Association of Japanese Geographers 2014 Autumn Meeting* **86**: 711, September, Toyama. (in Japanese)