Annual Report 2017

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

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

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

Daisuke ISHIMURA  Assistant Professor / D.Sc.
Tectonic Geomorphology, Quaternary Geology

Makoto KOBAYASHI  Project Associate Professor / PhD (D.Sc.) (From October, 2017)
Volcanology, Volcanic Geology, Quaternary Geology

Kaori AOKI  Project Researcher / PhD (From November, 2017)
Quaternary Science, Marine Tephrochronology, Chronology

Fumikatsu NISHIZAWA  Project Researcher / PhD (D.Sc.)
Tephrochronology, Volcanic Geology

Takako UTSUGAWA  Project Researcher / PhD (D.Sc.) (Until September, 2017)
Sedimentology, Transport and Depositional Processes

2) Overview of Research Activities

To prospect the futuristic view of environmental changes, our laboratory investigates the history and process of surface landform/geological development during the Quaternary period. The followings are some topics of our studies.

1. Reconstruction of geomorphological/geological phenomena during the Quaternary (the last 2–3 million years) with accuracies of $10^3$–$10^1$ years
2. Study on volcanic products (tephra) and explosive eruption history in and around the Japanese Islands
3. Investigation on production–transport–depositional processes of sedimentary particles
4. Study on coastal–deep marine sediment for reconstruction of natural hazard history and influence of human activity to natural environment
5. Reconstruction of earthquake recurrence interval and fault activity from earthquake/fault induced landform and sediment
6. Investigation on marine/fluvial terraces for reconstruction of landform development and crustal movement during the last $10^5$ years

3) List of Research Activities in FY2017

Peer-reviewed Articles


Ishimura, D. 2017. Re-examination of the age of historical and paleo-tsunami deposits at Koyadori


**Other Articles**


**Books**

None

**Reports**

None

**Book Reviews**
Miscellaneous Reports


Presentations


Ishimura, D. 2017. Historical and paleo-tsunami deposits on the Sanriku Coast, northeast Japan. the 8th International INQUA Meeting on Paleoseismology, Active Tectonics and Archeoseismology, November, Blenheim, New Zealand.


Ishimura, D., Toda, S., Mukoyama, S., Homma, S., Yamaguchi, K. and Takahashi, N. 2017. Three-dimensional surface displacements and deduced detailed locations of surface ruptures associated with the 2014 Mw6.2 Nagano earthquake from differencing pre- and post-earthquake LiDAR data set. 2017 Research meeting of Disaster Prevention Research Institute, Kyoto University, July, Kyoto. (in Japanese)


Toda, S. and Ishimura, D. 2017. Various types of class C faults being revealed by a strong combination of InSAR and conventional field survey. 2017 Research meeting of Disaster Prevention Research Institute, Kyoto University, July, Kyoto. (in Japanese)


Shibayama, A. and Nishizawa, F. 2017. Difference of awareness of disaster prevention in initial motion at occurrence of earthquake, comparison between indoor and outdoor environment—


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

Fumiaki FUJIBE                Project Professor / D.Sc.
Urban Climatology, Environmental Climatology

Jun-Ichi HAMADA              Project Associate Professor / PhD (D.Sc.)
Tropical Climatology, Meteorological Observation

Tomoshige INOUE              Project Assistant Professor / PhD (D.Sc.)
Monsoon Climatology, Climate Change, Global Warming

Masato NODZU                 Project Researcher / PhD (D.Sc.)
Tropical Climatology, Satellite Meteorology

Yoshihito SETO               Project Researcher / PhD (D.Sc.)
Urban Climatology, Local Climatology, Statistical Analysis

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 FY2017

Peer-reviewed Articles


*Other Articles*


Books


Reports


Book Reviews

None
**Miscellaneous Reports**


**Presentations**


Akasaka, I., Zaiki, M., Kubota, H. and Matsumoto, J. 2017. Characteristics on the seasonal march of
rainfall at Manila for the late 19th century – the early 20th century. *Abstracts of Japan Geoscience Union–American Geophysical Union Joint Meeting 2017*: ACG44-P05, May, Chiba. (Poster)


Murata, F., Terao, T., Fujinami, H., Hayashi, T., Asada, H., Matsumoto, J. and Syiemlieh, H. 2017. Dominant synoptic disturbance in the extreme rainfall at Cherrapunji, northeast India, based on


Takahashi, H.G. 2018. An interannual variation of summer precipitation over Southeast Asia and its association with the tropical cyclone activity along the monsoon trough. The 3rd International Workshop on Climate Change and Precipitation in the East Asia, February, Chiyoda.


Lightning Activities over the Coastal Region of Sumatra during the Pre-YMC Observations in 2015. *Abstract of the Asia Oceania Geosciences Society Annual Meeting* 14: AS14-A010, August, Singapore. (Poster)


Nodzu, M.I., Matsumoto, J., Trinh-Tuan, L. and Ngo-Duc, T. 2018. Validation of satellite-based
precipitation over northern Vietnam: mainly for the reproducibility in summer heavy-rain days.
Post-MAHASRI Planning Workshop, January, Nagoya. (in Japanese)


Hoshi, R. and Takahashi, H.G 2018. A lag-relationship between the Arctic Oscillation in winter and
the succeeding summer climate in the Northern Hemisphere. *Fifth International Symposium on Arctic Research*: G01-P03, January, Chiyoda. (Poster)

3. Laboratory of Environmental Geography

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

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

Takako UTSUGAWA  Project Researcher / PhD (D.Sc.) (From October, 2017)
Sedimentology, Transport and Depositional Processes

2) Overview of Research Activities
This research unit 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.

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 (Small Water Impounding Project) 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 FY2017

**Peer-reviewed Articles**


**Other Articles**


**Books**
None

**Reports**

**Book Reviews**
None

**Miscellaneous Reports**


Presentations


Kawahigashi, M., Kida, K. and Matsudaira, H. 2017. Land management and soil developmental processes under the green-infrastructure in Tokyo. SUITMA9 (Soils of Urban, Industrial, Traffic, Mining and Military Areas), S11, May, Moscow, Russia.


Battulaga, B. 2017. Preliminary study of visible plastic distribution along the river shore in Northern Mongolia. JST/SSH The 4th Symposium for Women Researchers, Poster Presentation Session, November, Shinjuku.

Kelly, C.L. 2017. Multi-Proxy study of the alluvial fan environment during the Holocene in the Qu’Appelle Valley, Saskatchewan. JST/SSH The 4th Symposium for Women Researchers, Poster


4. Laboratory of Geographical Information Sciences

1) Staff

Hiroshi MATSUYAMA 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

Takanori WATANABE Project Researcher / PhD (D.Sc.)
Urban Climatology, Atmospheric Chemistry, Modelling of Air Quality

2) Overview of Research Activities

This laboratory is mainly 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 lows 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
8. Quantitative evaluation of geographical phenomena in Tokyo in the modern era

3) List of Research Activities in FY2017

Peer-reviewed Articles


*Other Articles*


Miyazaki, S., Aoyama, M. and Sekido, A. 2018. Structurization of “Geographical Viewpoints” in
elementary social studies, the unit development using regional analysis of Itakura and Tsumagoi, Gunma. *Research in Educational Practice and Development, Gunma University* **35**: 1-16. (in Japanese)


**Books**


**Reports**


**Book Reviews**


**Miscellaneous Reports**


Matsuyama, H. 2017. Cubic Earth—What if the Earth were cube—. *Science Education Journal* No.56: 41-43. (in Japanese)


Nakaegawa, T., Yamanaka, T., Yokoo, Y., Matsuyama, H., Tokunaga, T., Tanakamaru, H., Hayashi, T.,


**Presentations**


Watanabe, T. and Izumi, T. 2017. Relation between power generation of wind power plant in mountainous area and prevailing wind direction. *Abstracts of the 2017 Fall Meeting of the


5. Laboratory of Urban and Human Geography

1) Staff
Yoshiki WAKABAYASHI Professor / PhD (D.Sc.)
Urban Geography, Behavioral Geography, Geographical Information Sciences

Akihiro TAKINAMI Associate Professor / PhD (D.Lit.)
Regional Studies, Representation Studies

Naoto YABE Associate Professor / PhD (D.Sc.)
Quantitative Geography, Urban Geography

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

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 FY2017

**Peer-reviewed Articles**

**Other Articles**


**Books**


**Reports**

None

**Book Reviews**


**Miscellaneous Reports**


**Presentations**


Wakabayashi, Y., Kukimoto, M. and Yui, Y. 2018. Changes in childcare service provision after the


