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 tephras 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**


**Other Articles**


*Books*


*Reports*

**Book Reviews**


**Presentations**


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)


Shirai, M. 2009. Sand grain transport from land to deep marine revealed by OSL. Special Symposium of Turbidite, April, Tsukuba. (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)


numerical simulation—. Japan Association for Quaternary Research, Programme and Abstracts 39: 4-5, 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)


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
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**


**Other articles**


**Reports**


Book Reviews

Miscellaneous Reports

Presentations
Study (iLEAPS) Science Conference, Volume I: 261-262, August, Melbourne, Australia.


Tanaka, H. 2009. High-altitude thermal belt observed at southern area of Mt. Yatsugatake. 2009 Annual Meeting of the Meteorological Society of Japan Tohoku Branch, December, Sendai. (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


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.


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


Other Articles


Reports


Miscellaneous reports


**Presentations**


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)


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 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
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**


**Other Articles**


**Books**


**Reports**


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)


**Book Reviews**


**Miscellaneous Reports**


**Presentations**


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)


Izumi, T., Saito, H., Nakayama, Y., Nakamura, K., Fukumoto, R., Sasaki, T., Yokomizo, M., Katagiri,


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)


Teshirogi, K., and Saito, H. 2010. Relationship between the seasonal variation in the day-trip herding

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.


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


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

Other articles


**Book reviews**


**Miscellaneous reports**


**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.


Kikuchi, T., and Arima, T. 2010. Conservation and wise use of natural resources: A case study from the world heritage site, Fraser Island. Front Lined Researches of Ecotourism and Ogasawara Island’s Plants, March, Ogasawara. (in Japanese)


