

Annual Report 2020

Geography

Department of Geography

Graduate School and Faculty of Urban Environmental Sciences

Tokyo Metropolitan University

Contents

1. Laboratory of Quaternary Geology and Geomorphology	1
1) Staff	
2) Overview of Research Activities	
3) List of Research Activities in FY2020	
2. Laboratory of Climatology	10
1) Staff	
2) Overview of Research Activities	
3) List of Research Activities in FY2020	
3. Laboratory of Environmental Geography	20
1) Staff	
2) Overview of Research Activities	
3) List of Research Activities in FY2020	
4. Laboratory of Geographical Information Sciences.....	25
1) Staff	
2) Overview of Research Activities	
3) List of Research Activities in FY2020	
5. Laboratory of Urban and Human Geography.....	31
1) Staff	
2) Overview of Research Activities	
3) List of Research Activities in FY2020	

1. Laboratory of Quaternary Geology and Geomorphology

1) Staff

Professor : Takehiko SUZUKI

Geomorphology, Quaternary Science, Volcanology

Associate Professor : Masaaki SHIRAI

Sedimentology, Quaternary Geology, Marine Geology

Assistant Professor : Daisuke ISHIMURA

Tectonic geomorphology, Quaternary Geology

Project Assistant Professor : Masanori MURATA

Tephrochronology, Quaternary Geology

Project Researcher : Kaori AOKI

Quaternary Science, Marine Tephrochronology, Geochronological Dating

Project Researcher : Takayuki TAKAHASHI

Fluvial geomorphology, Quaternary Geology, Tephrochronology

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 10^5 – 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/fluviat terraces for reconstruction of landform development and crustal movement during the last 10⁵ years

3) List of Research Activities in FY2020

Peer-reviewed Articles

- Fukushima, Y. and Ishimura, D. 2020. Characteristics of secondary-ruptured faults in the Aso Caldera triggered by the 2016 Mw 7.0 Kumamoto earthquake. *Earth, Planets and Space* **72**: 175. <https://doi.org/10.1186/s40623-020-01306-y>
- Ishimura, D. and Yamada, K. 2021. Integrated lateral correlation of tsunami deposits during the last 6000 years using multiple indicators at Koyadori, Sanriku Coast, northeast Japan. *Quaternary Science Reviews* **256**: 106834. <https://doi.org/10.1016/j.quascirev.2021.106834>
- Ishimura, D., Tsutsumi, H., Toda, S., Fukushima, Y., Kumahara, Y., Takahashi, N., Ichihara, T. and Takada, K. 2021. Repeated triggered ruptures on a distributed secondary fault system: an example from the 2016 Kumamoto earthquake, southwest Japan. *Earth, Planets and Space* **73**: 39. <https://doi.org/10.1186/s40623-021-01371-x>
- Kobayashi, M., Aoki, K., Murata, M., Nishizawa, F. and Suzuki, T. 2020. Tephrostratigraphy and eruption history after Miyatsukayama event on Niijima Volcano, Izu Islands, Japan. *Bulletin of the Volcanological Society of Japan* **65**: 21–40. (in Japanese with English abstract)
- McLean, D., Albert, P. G., Suzuki, T., Nakagawa, T., Kimura, J.-I., Chang, Q., Miyabuchi, Y., Manning, C. J., MacLeod, A., Blockley, S. P. E., Staff, R. A., Yamada, K., Kitaba, I., Yamasaki, A., Haraguchi, T., Kitagawa, J., SG14 Project Members and Smith, V. C. 2020. Constraints on the timing of explosive volcanism at Aso and Aira calderas (Japan) between 50 and 30 ka: New insights from the Lake Suigetsu sedimentary record (SG14 core). *Geochemistry, Geophysics, Geosystems* **21**: e2019GC008874. <https://doi.org/10.1029/2019GC008874>
- Naya, T., Nakayama, T., Suzuki, T., Sakata, K. and Nakazawa, T. 2020. Stratigraphy of the Pleistocene Tokyo Formation in the Kita-ku Central Park (Chuo-Koen) core in Kita-ku, Tokyo, central Japan. *The Journal of the Geological Society of Japan* **126**: 575–587. (in Japanese with English Abstract) <https://doi.org/10.5575/geosoc.2020.0027>
- Takahashi, T. and Sugai, T. 2021. Spatiotemporally varying inter-relationships between mainstem riverbed elevation and tributary sediment supply since the last interglacial in the upper Ara River, central Japan. *Geomorphology* **383**: 107697. <https://doi.org/10.1016/j.geomorph.2021.107697>

Other Articles

- Aoki, K. 2021. Examination of cryptotephrostratigraphy performed by recycling the residue

- from samples used in a paleoceanographic study of foraminiferal fossils from the MD01-2421 sediment core collected off the Kashima coast of east Japan. *Geographical Reports of Tokyo Metropolitan University* **56**: 1–11.
- Ishihama, S., Kasama, T., Nishizawa, F., Taguchi, K. and Yamashita, H. 2021. Geology of the Oiso Hills in subduction-collision tectonics. *Research Report of the Kanagawa Prefectural Museum, Natural History* **16**: 49–68. (in Japanese with English abstract)
- Kasama, T. and Nishizawa, F. 2021. Tephrostratigraphic studies on the "Kanto Loam" and the middle Pleistocene marker tephras distributed in Kanagawa Prefecture. *Research Report of the Kanagawa Prefectural Museum, Natural History* **16**: 161–180. (in Japanese with English abstract)
- Kawajiri, K., Kasama, T., Nishizawa, F., Nozaki, A. and Taguchi, K. 2021. Geology of the Nakatsu Group and terrace deposits in the Sagamino Upland, central part of Kanagawa Prefecture. *Research Report of the Kanagawa Prefectural Museum, Natural History* **16**: 125–136. (in Japanese with English abstract)
- Nozaki, A., Kasama, T., Nishizawa, F. and Taguchi, K. 2021. Quaternary deposits of the Tama Hills and Shimosueyoshi Upland, central Japan. *Research Report of the Kanagawa Prefectural Museum, Natural History* **16**: 107–123. (in Japanese with English abstract)
- Shibata, K., Nozaki, A., Takahashi, N., Kasama, K., Nishizawa, F. and Taguchi, K. 2021. Neogene and Quaternary deposits of the Miura Peninsula, central Japan: Accretionary prism, trench slope break, and forearc basin deposits. *Research Report of the Kanagawa Prefectural Museum, Natural History* **16**: 69–106. (in Japanese with English abstract)
- Suzuki, T. 2020. Chapter 1 Landforms of Tokyo. In *Geography of Tokyo*, ed. Kikuchi. T. and Matsuyama, H., 9–16, Tokyo: Asakura Publishing Co., Ltd. (in Japanese)
- Suzuki, T. 2020. Close-up Tokyo's underground. In *Geography of Tokyo*, ed. Kikuchi. T. and Matsuyama, H., 19–20, Tokyo: Asakura Publishing Co., Ltd. (in Japanese)
- Suzuki, T. 2020. Close-up Earthquakes and countermeasures. In *Geography of Tokyo*, ed. Kikuchi. T. and Matsuyama, H., 21–22, Tokyo: Asakura Publishing Co., Ltd. (in Japanese)
- Suzuki, T. 2020. Close-up Mt. Fuji and Tokyo. In *Geography of Tokyo*, ed. Kikuchi. T. and Matsuyama, H., 23–24, Tokyo: Asakura Publishing Co., Ltd. (in Japanese)
- Suzuki, T. 2020. 2: Structure of underground and geology, 3: Geomorphic development (Buildings of Japanese Islands and Kanto Plain, Plate movement and emergence of the Kazusa Trough) in Chapter 1 Landforms and Geology of Minato Ward. In *History of Minato City, Nature*, ed. General Affairs Division, General Affairs Department, Minato Ward, 20–30, Tokyo: Minato Ward. (in Japanese)
- Suzuki, T. 2021. Disaster prevention: Preparation for volcanic disaster, Shimabara Peninsula, Shimabara City, Nagasaki Prefecture. In *Advance Geographical Teaching Materials for Junior*

- High School*, ed. Editorial Division of Teikoku-Shoin Co., Ltd., 139, Tokyo: Teikoku-Shoin Co., Ltd. (in Japanese)
- Suzuki, T. 2021. Disaster prevention: Eruption of Mt. Fuji and volcanic ash fall. In *Advance Geographical Teaching Materials for Junior High School*, ed. Editorial Division of Teikoku-Shoin Co., Ltd., 161, Tokyo: Teikoku-Shoin Co., Ltd. (in Japanese)
- Suzuki, T. 2021. Chapter 1 Development of Ogasawara Islands. In *Ogasawara Islands*, ed. Tokyo Metropolitan University Ogasawara Research Committee, 2–12, Tokyo: Asakura Publishing Co., Ltd. (in Japanese)
- Suzuki, T. 2021. Chapter 1 Geomorphological viewing and thinking of region. In *How to learn Geography*. ed. Kikuchi, T. 6–13, Tokyo: Ninomiya-shoten. (in Japanese)
- Suzuki, T. 2020. Chapter 1 Tokyo's landforms. In *Geography of Tokyo*, ed. Kikuchi. T., Matsuyama, H., Sasaki, L. and Ranaweera, E. 9–16. Tokyo: Asakura Publishing Co., Ltd.
- Suzuki, T. 2020. Close-up Tokyo's underground. In *Geography of Tokyo*, ed. Kikuchi. T., Matsuyama, H., Sasaki, L. and Ranaweera, E. 19–20. Tokyo: Asakura Publishing Co., Ltd.
- Suzuki, T. 2020. Close-up Earthquakes and countermeasures. In *Geography of Tokyo*, ed. Kikuchi. T., Matsuyama, H., Sasaki, L. and Ranaweera, E. 21–22. Tokyo: Asakura Publishing Co., Ltd.
- Suzuki, T. 2020. Close-up Mt. Fuji and Tokyo. In *Geography of Tokyo*, eds. Kikuchi. T., Matsuyama, H., Sasaki, L. and Ranaweera, E. 23–24. Tokyo: Asakura Publishing Co., Ltd.
- Suzuki, T., Harvey, J., Matsukaze, J., Sato, J., Sasamori, K., Akikusa, K., Jensen, B., Kawashima, S., Kokubun, K., Kawai, M. and Nakayama, T. 2021. Identification of Early Pleistocene tephra in the Fuchu core, Musashino Uplands, Tokyo. *Geographical Reports of Tokyo Metropolitan University* **56**: 13–22.
- Utsugawa, T., Yokoyama, T. and Kim, Y. 2021. Conduct of practical classes through online lesson using Office 365 and case model of online student assistant: the case study of “basic computer literacy and processing”. *Bulletin of Geo-Environmental Science* **23**: 105–114. (in Japanese)
- Yamaguchi, T., Hiroyuki, Y., Mannen, K. and Kobayashi, M. 2021. Geology and eruptive history of Hakone Volcano, central Japan: Reviewing two decades of progress. *Research Report of the Kanagawa Prefectural Museum, Natural History* **16**: 137–160. (in Japanese with English abstract)

Books

None

Reports

- Kobayashi, M. 2021. Natural and geographical environment of the Omiya-Murayamaguchi mountain trail. *Mt. Fuji Pilgrimage Road Survey Report*: 22–40. (in Japanese)
- Matsukaze, J. and Kawajiri, K. 2021. Tephras in the Tozurahara Formation and its correlative beds, in the northwestern part of the Sagamihara city Kanagawa Prefecture, central Japan. *Bulletin of the Sagamihara City Museum* **29**: 28–33. (in Japanese)

Book Reviews

- Suzuki, T. 2020. Book Review of Science of Large-scale Natural Disasters in Shizuoka by Iwata, T., Kitamura, A. and Koyama, M. *Bulletin of the Volcanological Society of Japan* **65**: 89–90. (in Japanese)
- Suzuki, T. 2020. Book review of Visit and Watch the Historical Major Sediment Disasters (Part 2) by Inoue, K. *The Quaternary Research* **59**: 85. (in Japanese)

Miscellaneous Reports

- Kobayashi, M. 2021. Research on the eruption history of Fuji Volcano: volcanology for understanding worship and artistic of Mt. Fuji, a world heritage. *Fujinology* **1**: 5–19. (in Japanese)
- Nakano, T., Ishimura, D., Goto, H. and Yamanaka, T. 2020. Active fault map, Hakusan. Geographical Survey Institute. (in Japanese)
- Suzuki, T. 2020. Memory of Professor Kadomura and his research: at Fukazawa and Minamiosawa. In Memorial Collection for Professor Hiroshi Kadomura, ed. Memorial Event Executive Committee for Professor Hiroshi Kadomura, 89–92. Tokyo: Memorial Event Executive Committee for Professor Hiroshi Kadomura. (in Japanese)
- Suzuki, T. 2021. Natural disasters in Izu Islands—Volcanic disaster to landslide disaster—. *JSC Magazine, “Civil Engineering”* **106**: 40–41. (in Japanese)
- Takahashi, T., Kubota, Y. and Murata, M. 2020. The first challenge of general meeting and awards ceremony online; Impressions of online committee members. *Quaternary Newsletter (Daiyonki-Tsushin)* **59**(5), 10–11. (in Japanese)
- Utsugawa, T. 2020. Raised atoll and lagoon of Ouvéa Island, New Caledonia. *Journal of the Sedimentological Society of Japan* **79**: 2.

Presentations

- Akiyama, T. 2021. Coastal transport process of gravels estimated from changes in lithological composition and form of gravels along the Seisho Coast, central Japan. *The 13th meeting studying on graduation thesis in Odawara and Ashigara areas*, February, Online. (in Japanese)

Japanese)

- Aoki, K., Takahashi, T., Kobayashi, M., Murata, M., and Suzuki, T. 2020. Tephrostratigraphy of drilled core C9010E off the Boso Peninsula: the discovery of the new-face tephra described on the Toshima and the tephra provided from the Asama volcano. *Japan Association for Quaternary Research, Programme and Abstracts* **50**, 5, December, Online (in Japanese).
- Chigira, M. and Suzuki, T. 2020. Summary of the earthquake-induced landslides of pyroclastic fall deposits for predicting the potential sites of future landslide. *Abstracts of JpGU-AGU Joint Meeting 2020: HDS12-04*, July Online.
- Egawa, K., Sasaki, H., Chiba, T., Sano, M., Sakamoto, T., Kishimoto, E. and Kobayashi, M. 2020. Projection mapping of Fuji Volcano using red relief image model. *Programme and Abstracts, the Volcanological Society of Japan 2020 Fall Meeting: 80*, Online. (in Japanese)
- Ishimura, D. and Ebina, Y. 2020. Historical and geological examination of the tsunami tradition in Koyadori, Yamada Town, Iwate prefecture. *Abstracts of the Society of Historical Earthquake Studies Meeting 2020*, September, Online. (in Japanese)
- Ishimura, D., Yamada, K. 2020. Ages and distribution of paleo-tsunami deposits since 6 ka at Koyadori, Yamada Town, Iwate prefecture, northeast Japan. *Abstracts of JpGU-AGU Joint Meeting 2020: O-09: MIS01-P04*, July, Online.
- Ishimura, D., Iwasa, Y., Takahashi, N., Oda, R., Tadokoro, R., Kajii, K., Matsukaze, J., Ishizawa, T. and Tsutsumi, H. 2020. Paleo-seismological survey on the Futagawa fault at Futa, Nishihara Village, Kumamoto prefecture. *Abstracts of JpGU-AGU Joint Meeting 2020: SSS16-08*, July, Online. (in Japanese)
- Kamiya, T., Goto, K., Ishizawa, T., Tetsuka, H., Velasco, E.R., Ishimura, D. and Satoh, K. 2020. Machine-learning for correlation of tsunami deposits using geochemical proxy. *Abstracts of JpGU-AGU Joint Meeting 2020: MIS01-P05*, July, Online.
- Kawai, T. 2020. Crypt tephra detection and correlation in loess covering fluvial terrace surface formed in the earlier half of Late Pleistocene in the drainage of the Nanakita River, Sendai City, Northeast Japan. *Japan Association for Quaternary Research, Programme and Abstract* **50**: 29, December, Online. (in Japanese)
- Kobayashi, M. 2021. About the appearance characteristics of volcanic weathered soil around Mt. Fuji. *35th Archeology Study Group Tokai Regular Meeting*, February, Online. (in Japanese)
- Kobayashi, M. and Baba, A. 2020. Volcano research promoted by Mt. Fuji World Heritage Centre, Shizuoka. *Proceedings of the International Meeting on Eruptive History and Informatics 2020-1*: 1-02, September, Online. (in Japanese)
- Mashiko, M., Chigira, M., Furuki, H. and Suzuki, T. 2020. Long-term rates of gravitational slope deformations on a low-angle fault that forms a dip slope in the Shimanto Belt, in the Kanto Mountains. *Abstracts of JpGU-AGU Joint Meeting 2020: HDS09-06*, July, Online.

- Matsukaze, J. and Kawajiri, K. 2020. Tephra beds of the Tozurahara Formation and its correlative beds, in the northwestern part of the Sagami-hara City, Kanagawa Prefecture, central Japan. *Japan Association for Quaternary Research, Programme and Abstract* **50**: 21, December, Online. (in Japanese)
- Murata, M., Kobayashi, M., Takahashi, T., Aoki, K. and Suzuki, T. 2020. Eruption preceding the 9th century Tenjosan eruption in the northern Kozushima, Izu Islands. *Abstracts of JpGU-AGU Joint Meeting 2020*: SVC45-03, July, Online. (in Japanese)
- Murata, M., Kobayashi, M., Aoki, K., Takahashi, T., Nishizawa, F. and Suzuki, T. 2020. Estimation of eruption volume of the Kozushima Volcano since 30 ka, Izu Islands. *Programme and Abstracts, the Volcanological Society of Japan, 2020 Fall Meeting*: 87, October, Online. (in Japanese)
- Okuno, M., Ishihara, Y., Miyoshi, M., Tsuruta, N., Toda, S., Yamada, K., Tkarada, S., Suzuki, T., Torii, M. and Hayakawa, M. 2020 Transition from international study on eruption history and informatics to geological and information complex researches to prepare for low-frequency and large-scale disasters. *The International Meeting on Eruptive History and Informatics 2020-1*, September, Online. (in Japanese)
- Sasaki, N., Sugai, T. and Takahashi, T. 2020. Wetland landscape in mountain region created by landslides. *Abstracts of JpGU-AGU Joint Meeting 2020*: MIS24-13, July, Online. (in Japanese)
- Sasamori, K. and Koarai, M. 2020. Landform evolution of Budokubo Area, Niigata Prefecture, Japan. *Abstracts of JpGU-AGU Joint Meeting 2020*: HQR06-P03, July, Online. (in Japanese)
- Sato, K., Yamada, M., Ishimura, D. and Baba, T. 2020. Tsunami source estimation based on the distribution of paleotsunami deposits on the north coast of the Shimokita Peninsula, northwest Japan. *Abstracts for Annual Meeting of the Sedimentological Society of Japan 2020*: 4-5, November, Online. (in Japanese)
- Shimazu, H. and Utsugawa, T. 2020. Behavior of the sediments and detritus transported by floodwater on the embanked floodplain and its depositional record in the lower reaches of the Natori River. *Abstracts of JpGU-AGU Joint Meeting 2020*: HGM03-P04, July, Online. (in Japanese)
- Shirai, M. and Utsugawa, T. 2020. Depositional process on riverbed of the Tama River caused by the floodflow of T1919: An example around the Tachikawa City, Tokyo. *Abstracts for Annual Meeting of the Sedimentological Society of Japan 2020*: P-1, November, Online. (in Japanese)
- Shirai, M., Takahashi, T., Utsugawa, T. and Kawajiri, K. 2020. Saruhashi lava and change in river-channel course around boundary of the Tsuru and Otsuki cities. *Japan Association for Quaternary Research, Programme and Abstracts* **50**: 23, December, Online. (in Japanese)
- Shirai, M., Kobayashi, M., Utsugawa, T., Kawajiri, K. and Takahashi, T. 2020. Characteristics of

- the Fuji-Sagamigawa Lahar deposit at the upper reaches of Sagami River, central Japan. *Abstracts of JpGU-AGU Joint Meeting 2020*: HQR06-P06, July, Online. (in Japanese)
- Suzuki, T. 2020. Volcanic eruption and geomorphology. *Physical Geography Online Seminar 2020*, July, Online. (in Japanese)
- Suzuki, T. 2020. Activity and results of the Research Center for Volcanic Hazards and Their Mitigation, Tokyo Metropolitan University. *The International Meeting on Eruptive History and Informatics 2020-1*, September, Online. (in Japanese)
- Suzuki, T. 2021. Volcanoes and volcanic disasters in Japan and Tokyo. *Open University Introducing Research Centers of Tokyo Metropolitan University*, February, Online. (in Japanese)
- Suzuki, T. and Terayama, S. 2020. Development of the Izu-Oshima Pre-caldera Volcano examined by lacustrine deposits and tephras around the Funoh-Falls in the east coast region, Izu-Oshima Island, Japan. *Abstracts of JpGU-AGU Joint Meeting 2020*: SVC47-04, July, Online. (in Japanese)
- Suzuki, T. and Terayama, S. 2021. Development of the Izu-Oshima Pre-caldera Volcano examined by lacustrine deposits and tephras around the Funoh-Falls in the east coast region, Izu-Oshima Island, Japan. *Proceedings of the General Meeting of the Association of Japanese Geographers* **99**: 117, March, Online. (in Japanese)
- Suzuki, T., Chigira, M., Matsushi, T. and Nakayama, D. 2021. Assessment of earthquake-induced landslides potential on artificial landform transformation in the Tama Hills in a Volcanic Region. *Disaster Prevention Research Institute, Kyoto University Annual Meeting 2021*, February, Online. (in Japanese)
- Suzuki, T., Harvey, J., Matsukaze, J., Sato, J., Sasamori, K., Akikusa, K., Watanabe, T., Kawashima, S., Kokubun, K., Kawai, M. and Nakayama, T. 2020. Trace of Lower Pleistocene Kazusa Group from west Tama Hills to central-west Musashino Uplands, NE Japan. *Japan Association for Quaternary Research, Programme and Abstracts* **50**, December, Online. (in Japanese)
- Takahashi, T., Aoki, K., Murata, M., Kobayashi, M. and Suzuki, T. 2020. Stratigraphy and correlation of rhyolitic tephra beds in the Toshima, northern Izu Islands. *Japan Association for Quaternary Research, Programme and Abstracts* **50**, 4, December, Online. (in Japanese)
- Tano, T., Suzuki, T., Ishimura, D., Terayama, S. and Watanabe, T. 2020. Reconsideration of Late Quaternary tephrostratigraphy on Mikurajima Volcanic Island, Izu Islands. *Abstracts of JpGU-AGU Joint Meeting 2020*: SVC47-P09, July, Online. (in Japanese)
- Utsugawa, T. 2020. Hearing the “voice” of gravel—Riverine to coastal environment and society—. Delivery college, Risho University, November, Misato. (in Japanese)
- Utsugawa, T. 2021. Roundness in saturation: the relationship with production process of gravel

- and sand. *Proceedings of the General Meeting of the Association of Japanese Geographers 2021 Spring Meeting* **99**: 156, March, Online. (in Japanese)
- Utsugawa, T. and Shirai, M. 2020. Channel migration in the middle Tama River, central Japan, affected by Typhoon 1919 estimated from the sedimentological characteristic. *Abstracts of JpGU-AGU Joint Meeting 2020*: HGM03-P05, July, Online. (in Japanese)
- Utsugawa, T. and Shirai, M. 2020. Depositional environment of the lower part of lower Pleistocene Yamada Formation exposed at Kita-Asakawa River, Hachioji City, Tokyo. *Japan Association for Quaternary Research, Programme and Abstracts* **50**: 25, December, Online. (in Japanese)
- Watanabe, T. 2021. Establishment of detailed tephrostratigraphy in the Jaishi Oike Moor, southern Izu Peninsula, Japan. *The 69th National Geography Major Graduation Article Conference*: 102, March, Online. (in Japanese)
- Yamamoto, S., Nishizawa, F., Yoshimoto, M., Miyairi, Y., Yokoyama, Y., Suga, H. and Ohkouchi, N. Compound-specific ^{14}C analyses of fatty acids as potential dating tools for lake sediments: A case study from Lake Kawaguchi, central Japan. *Abstracts of JpGU-AGU Joint Meeting 2020*: HQR06-05, July, Online. (in Japanese)

2. Laboratory of Climatology

1) Staff

Professor : Jun MATSUMOTO

Monsoon Climatology, Environmental Climatology

Professor : Hideo TAKAHASHI

Urban Climatology, Climatic Change, Rainfall Climatology

Assistant Professor : Hiroshi TAKAHASHI

Asian Monsoon, Cloud-Precipitation Climatology, Regional Climate Modeling

Project Professor : Fumiaki FUJIBE

Urban Climatology, Environmental Climatology

Project Associate Professor : Jun-Ichi HAMADA

Tropical Climatology, Meteorological Observation

Project Assistant Professor : Tomoshige INOUE

Monsoon Climatology, Climate Change, Global Warming

Project Researcher : Yoshihito SETO

Urban Climatology, Local Climatology, Statistical Analysis

Project Researcher : Masato NODZU

Tropical Climatology, Satellite Meteorology

Project Researcher : Nozomi KAMIZAWA

Asian Monsoon, Climate Change, Climate Simulation

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 FY2020

Peer-reviewed Articles

- Abdillah, M.R., Kanno, Y., Iwasaki, T. and Matsumoto, J. 2021. Cold surge pathways in East Asia and their tropical impacts. *Journal of Climate* **34**: 157-170. <https://doi.org/10.1175/JCLI-D-20-0552.1>
- Fujibe, F. 2020. Tornado disaster at the Yodobashi Elementary School in Tokyo on 23 September 1903. *Wind Engineering Research* **26**: 120-129. (in Japanese with English abstract)
- Fujibe, F. 2020. Temperature anomaly in the Tokyo Metropolitan area during the COVID-19 (coronavirus) self-restraint period. *SOLA* **16**: 175-179. <https://doi.org/10.2151/sola.2020-030>
- Fujibe, F. and Matsumoto, J. 2021. Long-term trends of newspaper coverage on climate change and summer heat. *Journal of Heat Island Institute International* **16**: 1-8. (in Japanese with English abstract)
- Fujibe, F., Matsumoto, J. and Kamahori, H. 2020. A climatological study of heavy rainfalls due to Typhoon Hagibis in 2019. *Tenki* **67**: 595-607. (in Japanese with English abstract) https://doi.org/10.24761/tenki.67.10_595
- Fujibe, F., Matsumoto, J. and Suzuki, H. 2020. Regional features and temporal variations of heat-stroke ambulance transport rates in Japan: Comparison with mortality. *Journal of Heat Island Institute International* **15**: 1-13. (in Japanese with English abstract)
- Hayashi, S., Nakaike, C. and Fujibe, F. 2020. Radar characteristics of summer thunderstorms in the Kanto Plain of Japan with and without cloud-to-ground lightning. *Meteorology and Atmospheric Physics* **133**. <https://doi.org/10.1007/s00703-020-00748-z>
- Hilario M.R.A., Olaguera, L.M., Narisma, G.T. and Matsumoto, J. 2020. Diurnal characteristics

- of summer precipitation over Luzon Island, Philippines. *Asia-Pacific Journal of Atmospheric Sciences* **57**: 573-585. <https://doi.org/10.1007/s13143-020-00214-1>
- Konduru, R.T. and Takahashi, H. G. 2020. Effects of convection representation and model resolution on diurnal precipitation cycle over the Indian monsoon region: Toward a convection-permitting regional climate simulation. *Journal of Geophysical Research: Atmospheres* **125**, e2019JD032150. <https://doi.org/10.1029/2019JD032150>
- Kubota, H., Matsumoto, J., Zaiki, M., Tsukahara, T., Mikami, T., Allan R., Wilkinson, C., Wilkinson, S., Wood, K. and Mollan, M. 2021. Tropical cyclones since the mid-19th century over the western north Pacific. *Climatic Change* **164**: 29. <https://doi.org/10.1007/s10584-021-02984-7>
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- Olaguera, L.M., Matsumoto, J., Kubota, H., Cayanan, E.O. and Hilario, F.D. 2021. A climatological analysis of the monsoon break following the summer monsoon onset over Luzon Island, Philippines. *International Journal of Climatology* **41**: 2100-2117. <https://doi.org/10.1002/joc.6949>
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- Nodzu, M. I., Matsumoto, J., Seto, Y., Watanabe, T., Nakajima, K., Inoue, T., Hamada, J. I., Itou, Y. and Yanagisawa, T. 2020. Temperature-profile evolution in the surface boundary layer on a clear summer day, observed by an unmanned aerial vehicle. *Abstracts of the Meteorological Society of Japan 2020 Spring Meeting 117*: 172, May, preprint. (in Japanese)
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- Seto, Y., Tsunematsu, N. and Takahashi, H. 2020. Characteristics of surface wind convergence during localized heavy rainfall in Tokyo in summer. *Abstracts of the Meteorological Society of Japan 2020 Autumn Meeting* **118**: 233, October, Online. (in Japanese)
- Takahashi, H., Sugawara, H., Seto, Y., Nakajima, K., Ito, Y. and Tsunematsu, N. 2020. Preliminary analysis of the nighttime boundary layer temperature structure in the area from western suburbs and central Tokyo. *Abstracts of JpGU-AGU Joint Meeting 2020*: AAS15-01, July, Online. (invited)
- Takahashi, H., Sugawara, H., Seto, Y., Nakajima, K., Ito, Y. and Tsunematsu, N. 2020. Nocturnal boundary layer temperature structure in the area from central Tokyo to its western suburbs in winter. *Proceedings of the General Meeting of the Association of Japanese Geographers 2020 Fall Meeting* **98**: 21, November, Online. (in Japanese) https://doi.org/10.14866/ajg.2020a.0_65
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- Yamaji, M. and Matsumoto, J. 2020. Frontline of precipitation measurement from space. *Proceedings of the General Meeting of the Association of Japanese Geographers 2020 Fall Meeting* **98**: 56, October, Online. (in Japanese)
- Yamaji, M., Takahashi, H. G. and Matsumoto, J. 2021. Precipitation characteristics over the Asian monsoon region by the TRMM/GPM long-term precipitation radar dataset. GPM-Satellite Simulator Joint Research Meeting, March, Online. (in Japanese)
- Yamato, H., Takahashi, H. and Mikami, T. 2020. Daytime temperature distribution and sea breeze circulation in the Tokyo metropolitan area in summer. *Proceedings of the General Meeting of the Association of Japanese Geographers 2020 Fall Meeting* **98**: 22, November, Online. (in Japanese) https://doi.org/10.14866/ajg.2020a.0_111

3. Laboratory of Environmental Geography

1) Staff

Professor : Makiko WATANABE

Soil Geography, Environmental Dynamic Analysis, Geoarcheology

Associate Professor : Masayuki KAWAHIGASHI

Soil Ecology, Environmental Chemistry, Material Cycling in Ecosystems

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 of ancient water environment in Kharga, Western Desert, Egypt
4. Environmental dynamics study of watershed area of 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 elemental dynamics in urban ecosystems
8. Soil carbon sequestration from the point of view of soil parent material

3) List of Research Activities in FY2020

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- Nyamsanjaa K., Watanabe M., Sakagami N. and Oyuntsetseg B. 2021. Metal accumulation in sclerotium grains collected from low pH forest soils. *Journal of Environmental Sciences and Health Part A*: **56**: 303-309. <https://doi.org/10.1080/10934529.2021.1872316>
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- Nanzyo, M., Lal R., Kawahigashi, M., Kaneko, N., Hirai, H., Inubushi, K. and Yamamoto, Y. 2020. An open symposium of science council of Japan “Soil and sustainable development goals (SDGs) -Soils in Africa and Urban environment-”. *Japanese Journal of Soils Science and Plant Nutrition* **91**: 85-89.

Takashi, T., Osada, T., Murata, T., Endo, T., Yano, M. and Watanabe, M. 2020. Geomorphological properties of the earthworks in the Institute for Nature Study. *Miscellaneous Reports of the Institute Nature Study* **52**: 7-12.

Watanabe, M. 2021. Viewing and ways of thinking region with soil. In *How to study geography*, ed. Kikuchi T. *Various ways of viewing and thinking of regions*. Ninomiya-shoten: 22-29. (in Japanese)

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Watanabe, M. ed. 2021. *Sclerotia grains in soils - A new perspective from pedosclerotiology*. Progress in Soil Science Series. Singapore: Singapore Springer.

Reports

Soil Science Session, Committee of Agriculture, Science Council of Japan (Kawahigashi, M. is one of the member of the session) 2021. Current status and issues for urban soils. Science Council of Japan, <http://www.scj.go.jp/ja/info/kohyo/pdf/kohyo-24-h200915.pdf>.

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None

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Inubushi, K., Ohata, G., Kakiuchi, Y., Tanimichi, T., Mori, Y., Kikuchi, Y., Saito, H., Baba, J., Yashima, M., Takahashi, T., Kato, M., Kobayashi, T., Sugihara, S., Toyota, K., Nishikura, S. and Terigel 2020. Effect of land-use on soil physicochemical and microbial properties in Farm of Chiba University (at Numata city in Gunma prefecture) based on 29th Six universities' joint soil investigation. *Abstract of Annual Meeting of Japanese Society of Soil*

- Science and Plant Nutrition* **66**:141, September, Online. (in Japanese)
- Kajiwara, K. and Kawahigashi, M. 2021. Understand the growth of *Pinus thunbergii* in the coastal forest of Sendai, Japan, and consider the relationship with the soil characteristics of the planting base there. *Proceedings of the General Meeting of the Association of Japanese Geographers 2021 Spring Meeting* **99**: 137, March, Online. (in Japanese)
- Kakizaki, K., Tanaka, K., Hirota, M. and Kawahigashi, M. 2020. Vegetation succession taking into account the distribution of young trees in a red pine forest of Sugadaira Highland. *Proceedings of the General Meeting of the Association of Japanese Geographers 2020 Spring Meeting* **98**: 137, November, Online. (in Japanese)
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- Kawahigashi, M. and Battulga, B. 2020. Characterization of microplastics and organic coatings distributed in the urban river in Mongolia. *Abstract of the 36th Meeting of Japanese Humic Substances Society*, 13, November, Online. (in Japanese)
- Kawahigashi, M. and Battulga B. 2020. Microplastics in the river bottom sediment in the urban river of Mongolia. *Abstracts of JpGU-AGU Joint Meeting 2020*: AHW30-05, July, Online.
- Kawahigashi, M. and Battulga B. 2020. Polystyrene foam as a main carrier of microplastics in the urban river of Mongolia. *Abstract of the MICRO: 2020, Fate and Impacts of Microplastics: Knowledges and Responsibilities (online-based meeting)*: micro2020: 332824, November, Online.
- Kida, K., Ishizuka, S., Koga N. and Shirato Y. 2020. Changes of soil carbon stock and phosphate properties induced by cropland afforestation. *Abstract of Annual Meeting of Japanese Society of Soil Science and Plant Nutrition* **66**: 138, September, Online. (in Japanese).
- Morishita, M. and Ishitsuka, N. 2020. Estimating the spatial distribution of soil properties using UAV images and machine learning. *Abstract of Annual Meeting of Japanese Society of Soil Science and Plant Nutrition* **66**: 89 September, Online. (in Japanese)
- Morishita, M. Kida, K. and Kawahigashi, M. 2021. A new classification of peat materials considering inorganic contamination from outside the wetland system: using the dataset of peat soils in Hokkaido. *Proceedings of Japanese Society of Pedology on 2021*, March, Online. (in Japanese)
- Murata, T., Kawai, N., Tashiro, T., Endo, H., Yano, M. and Watanabe, M. 2020. Organic and inorganic properties of afforestation soils on embankment 500 years old. *Abstract of Annual Meeting of Japanese Society of Soil Science and Plant Nutrition* **66**: 16, September, Online. (in Japanese)
- Nishikura, S. and Kawahigashi, M. 2020. Characteristics of soil development process based on

- difference in soil properties in Japanese polder. *Abstract of Annual Meeting of Japanese Society of Soil Science and Plant Nutrition* **66**:74, September, Online. (in Japanese).
- Nyamsanjaa, K., Sakagami, N., Watanabe, M. and Oyuntsetseg, B. 2020. The concentrations of micro elements in sclerotia of *Cenococcum geophilum*. Goldschmidt Virtual 2020, June, Online.
- Osada, T., Tashiro, T., Murata, T. and Watanabe, M. 2020. Preliminary study of erosion and vegetation environment of the earthworks in the Institute for Nature Study. *Proceedings of the General Meeting of the Association of Japanese Geographers 2020 Autumn Meeting* **98**: 99, November, Online. (in Japanese)
- Srisomkiew, S., Kawahigashi, M. and Limthong, P. 2020. Digital soil mapping of soil fertility in Thung Kula Rong-Hai region, Thailand using a machine learning algorithm. *Abstracts of JpGU-AGU Joint Meeting 2020: ACG50-03*, July, Online.
- Srisomkiew, S., Kawahigashi, M. and Limthong, P. 2020. Digital soil mapping using spectral indices calculated by a machine learning technique in a paddy field for jasmine rice certified by the Protected Geographical Indication. *Abstract of Annual Meeting of Japanese Society of Soil Science and Plant Nutrition* **66**: 78, September, Online.
- Srisomkiew, S., Kawahigashi, M. and Limthong, P. 2021. Prediction of soil properties by digital soil mapping with limited soil data from the Thung Kula Ronghai region, Thailand. *Abstract of the Pedometrics Webinar 2021*: 18, February, Online.
- Tamura, G., Nyamsanjaa, K., Watanabe, M. and Oyuntsetseg, B. 2021. Characterization of forest steppe ecotone with focus on soil free iron oxides. *Proceedings of the General Meeting of the Association of Japanese Geographers 2021 Spring Meeting* **99**: 98, March, Online. (in Japanese)
- Todoroki, T., Guo, Y., Takashima, Y., Watanabe, M., Nishizawa, T., Narisawa, K. and Sakagami, N. 2020. An attempt of reforestation in the clearing site with applying *Fagus* symbiotic fungi in Komado marsh. *Japanese Society of Soil Microbiology* **21**, June, Preprint. (in Japanese)
- Watanabe, M. and Genseki, A. 2020. Micromorphological features of sclerotia of *Cenococcum* spp. collected from low pH forest soils. Goldschmidt Virtual 2020, June, Online.

4. Laboratory of Geographical Information Sciences

1) Staff

Professor : Hiroshi MATSUYAMA

Hydrometeorology, Land Surface–Atmosphere Interaction, Statistical Analysis, Programming

Assistant Professor : Takeki IZUMI

Urban Climatology, Geographical Information Sciences, Numerical Meteorological Modelling

Assistant Professor : Daichi NAKAYAMA

Computational Geomorphology, Geographical Information Sciences, Remote Sensing

Project Researcher : Takanori WATANABE

Urban Climatology, Atmospheric Chemistry, Air Quality Modelling

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 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

8. Quantitative evaluation of geographical phenomena in Tokyo in the modern era

3) List of Research Activities in FY2020

Peer-reviewed Articles

- Fujitsuka, Y. and Kim, Y. 2020. Tourism gentrification in Bukchon, Seoul. *Annual Report of Japan Society for Urbanology* **53**: 257-263. (in Japanese)
- Kopysov, S. G., Zemtsov, V. A., Matsuyama, H. and Eliseev, A. O. 2020. River flow hydrograph simulation in the western Siberia lowland north for the extreme flood flow prediction based on the HBV-light model. *Geosphere Research* **2020**(4): 108-120. (in Russian with English abstract) <https://doi.org/10.17223/25421379/17/9>
- Kuzhevskaja, I.V., Nechepurenko, O.E., Chursin, V.V. and Matsuyama, H. 2020. Analysis of climatic extremity since the 1950s in the mountain Altai territory. *Geosphere Research* **2020**(3): 97-108. (in Russian with English abstract) <https://doi.org/10.17223/25421379/16/8>
- Matsuyama, H., Saito, H. and Zemtsov, V. 2021. Application of Soil Water Index to landslide prediction in snowy regions: Sensitivity analysis in Japan and preliminary results from Tomsk, Russia—. *Progress in Earth and Planetary Science* **8**(17). <https://doi.org/10.1186/s40645-021-00408-9>

Other Articles

- Ishikawa, K. 2020. Natural springs and *tofu* production. In *Geography of Tokyo*, ed. T. Kikuchi and H. Matsuyama, 67-68. Tokyo: Asakura Publishing Co. Ltd. (in Japanese)
- Ishikawa, K. 2020. Natural springs and *tofu* production. In *Geography of Tokyo*, ed. T. Kikuchi, H. Matsuyama, L. Sasaki and R. Eranga, 67-68. Tokyo: Asakura Publishing Co. Ltd.
- Matsuyama, H. 2020. Discover Tokyo. In *Geography of Tokyo*, ed. T. Kikuchi and H. Matsuyama, 1-8. Tokyo: Asakura Publishing Co. Ltd. (in Japanese)
- Matsuyama, H. 2020. Kanda River and its flow. In *Geography of Tokyo*, ed. T. Kikuchi and H. Matsuyama, 17-18. Tokyo: Asakura Publishing Co. Ltd. (in Japanese)
- Matsuyama, H. 2020. Tokyo's waters and seas. In *Geography of Tokyo*, ed. T. Kikuchi and H. Matsuyama, 57-64. Tokyo: Asakura Publishing Co. Ltd. (in Japanese)
- Matsuyama, H. 2020. Tokyo's hot springs. In *Geography of Tokyo*, ed. T. Kikuchi and H. Matsuyama, 71-72. Tokyo: Asakura Publishing Co. Ltd. (in Japanese)
- Matsuyama, H. 2020. Discover Tokyo. In *Geography of Tokyo*, ed. T. Kikuchi, H. Matsuyama, L. Sasaki and R. Eranga, 1-8. Tokyo: Asakura Publishing Co. Ltd.
- Matsuyama, H. 2020. Kanda River and its flow. In *Geography of Tokyo*, ed. T. Kikuchi, H. Matsuyama, L. Sasaki and R. Eranga, 17-18. Tokyo: Asakura Publishing Co. Ltd.

- Matsuyama, H. 2020. Tokyo's waters and seas. In *Geography of Tokyo*, ed. T. Kikuchi, H. Matsuyama, L. Sasaki and R. Eranga, 57-64. Tokyo: Asakura Publishing Co. Ltd.
- Matsuyama, H. 2020. Tokyo's hot springs. In *Geography of Tokyo*, ed. T. Kikuchi, H. Matsuyama, L. Sasaki and R. Eranga, 71-72. Tokyo: Asakura Publishing Co. Ltd.
- Matsuyama, H. 2021. Chapter 2.2: Hydrological environment of Ogasawara Islands. In *Ogasawara (Bonin) Islands, world natural heritage site—Nature, history and culture—*, ed. Ogasawara Research Committee of Tokyo Metropolitan University, 52-61. Tokyo: Asakura Publishing Co. Ltd. (in Japanese)
- Matsuyama, H. 2021. How to perceive and understand regions from the viewpoint of hydrological environment? In *How to study geography?* ed., T. Kikuchi, 30-37. Tokyo: Ninomiya-Shoten. (in Japanese)
- Matsuyama, H. and Kikuchi, T. 2021. Chapter 2.3: Excursion on the hydrological and marine environments of Ogasawara Islands. In *Ogasawara (Bonin) Islands, world natural heritage site—Nature, history and culture—*, ed. Ogasawara Research Committee of Tokyo Metropolitan University, 62-67. Tokyo: Asakura Publishing Co. Ltd. (in Japanese)
- Nakayama, D. 2020. Edo's waterworks. In *Geography of Tokyo*, ed. T. Kikuchi and H. Matsuyama, 69-70. Tokyo: Asakura Publishing Co. Ltd. (in Japanese)
- Nakayama, D. 2020. Edo's waterworks. In *Geography of Tokyo*, ed. T. Kikuchi, H. Matsuyama, L. Sasaki and R. Eranga, 69-70. Tokyo: Asakura Publishing Co. Ltd.
- Nakayama, D. 2020. Geohazard map of Izu Islands, Japan. ESRI Mapbook **35** <https://www.esri.com/en-us/esri-map-book/maps#/details/6/1> (last accessed 31 March 2021)

Books

- Kikuchi, T. and Matsuyama, H. eds. 2020. *Geography of Tokyo*. Tokyo: Asakura Publishing Co. Ltd. (in Japanese)
- Kikuchi, T., Matsuyama, H., Sasaki, L. and Eranga, R. 2020. *Geography of Tokyo*. Tokyo: Asakura Publishing Co. Ltd.

Reports

- Miyoshi, S., Saito, Y. and Maatsuyama, H. 2020. Estimation of leaf area index of *Cryptomeria japonica* using various methods—Have forests of *Cryptomeria japonica* in the Aso district, Kumamoto prefecture been growing?—. *Proceedings of 22nd CEReS Symposium on Environmental Remote Sensing*: 97 (in Japanese)

Book Reviews

- Matsuyama, H. 2020. Book review (Yajima, M.: The biography of geologist Edmund Naumann:

- The Oyatoi challenging Fossa Magna). *Geographical Review of Japan* **93**: 239-240. (in Japanese)
- Matsuyama, H. 2020. Book review (Uchiyama, S.: Drone utilization guide). *Chiri* **65**(11): 119. (in Japanese)
- Matsuyama, H. 2021. Book review (Abernathy, D.: Using geodata & geolocation in the social sciences: Mapping our connected world). *Chiri* **66**(3): 103. (in Japanese)

Miscellaneous Reports

- Editorial Board of Geographical Review of Japan Ser. A. (written by H. Matsuyama) 2020. Message from Editorial Board of Geographical Review of Japan Ser. A. *Geographical Review of Japan* **93**: 476. (in Japanese)
- Hasegawa, K. 2020. A field study of geographical and geological education in a senior high school core curriculum. *Chiri* **65**(6): 108-113. (in Japanese)
- Hasegawa, K. 2020. Uncertainty predictions; teaching the potential risk of global warming in a continually changing future. *Chiri* **65**(12): 22-27. (in Japanese)
- Hasegawa, K. 2021. Making a model of the solar system drawn on a scale of 1:1,000,000,000,000 —Introduction of astronomical education in senior high school—. *Forum Report—Science & Mathematics—* No.32: 13-18. (in Japanese)
- Ishikawa, K. 2020. Where there are natural springs, there are tofu producers? Understanding the nature and culture of Tokyo through geography. Jinbundo. <https://book.asahi.com/jinbun/article/13979556> (last accessed 5 December 2020)
- Matsuyama, H. 2020. Expectation to future numerical prediction. 60th anniversary of numerical prediction. *History of Numerical Prediction Division of Japan Forecast Department, Japan Meteorological Agency for 60 years from 1959 to 2019*: 41-42. (in Japanese)
- Matsuyama, H. 2020. Results on the election of 17th's board members of Japan Society of Hydrology and Water Resources. *Journal of Japan Society of Hydrology and Water Resources* **33**: 179. (in Japanese)
- Matsuyama, H. 2020. A study on the hydrological cycle of Ogasawara (Bonin) Islands. *The Ogasawara* No.230: 2. (in Japanese)
- Matsuyama, H. 2020. Topic on the taking a detour train in the suburbs of Tokyo area. *Annual Report of Old Boys/Girls of Wandervogel Club in the University of Tokyo* **12**: 63-66. (in Japanese)
- Matsuyama, H. 2021. Comments on the message from the Editor in Chief, Journal of Japan Society of Hydrology and Water Resources in 2021-2022. *Journal of Japan Society of Hydrology and Water Resources* **34**: 69-70. (in Japanese)
<https://doi.org/10.3178/jjshwr.34.69>

Presentations

- Flores, J. and Matsuyama, H. 2020. How tropical cyclones influence seasonal variability of precipitation in Ogasawara (Bonin) Islands during El Niño events, La Niña events, and normal conditions? *Abstracts of the 2020 Spring Meeting of the Meteorological Society of Japan* **117**: 135, May, Preprint. (in Japanese)
- Fujitsuka, Y. 2021. Gentrification in North Brooklyn, New York City and regional geography education. *Proceedings of the General Meeting of the Association of Japanese Geographers 2021 Spring Meeting* **99**: 22, March, Online. (in Japanese)
- Hasegawa, K. 2020. Teaching risks of global warming in a continually changing global climate. *Abstracts of JpGU-AGU Joint Meeting 2020*: O01-08 (invited), July, Online. (in Japanese with English abstract)
- Kanno, H. and Matsuyama, H. 2021. Reconstruction of precipitation before 1906 at Chichi-jima in Ogasawara (Bonin) Islands using old documents. *Proceedings of the General Meeting of the Association of Japanese Geographers 2021 Spring Meeting* **99**: 90, March, Online. (in Japanese)
- Kirimura, T., Iijima, Y. and Saito, H. 2021. Population changes after the 2000s in the Sakha Republic, Russian Federation. *Proceedings of the General Meeting of the Association of Japanese Geographers 2021 Spring Meeting* **99**: 159, March, Online. (in Japanese)
- Miyoshi, S. 2021. Satellite remote sensing on the effect of drought on vegetation activity: A case study at Chichi-jima, Ogasawara (Bonin) Islands. Debrief Session of Graduation and Master Theses of Tokyo Metropolitan University in FY2020, February, Online. (in Japanese)
- Natsume, M and Nemoto, Y. 2020. Distribution of shogunate controlled territories around Edo in the 1640s. 29th Conference of GIS Association of Japan, October, Online. (in Japanese)
- Nemoto, Y. and Natsume, M. 2020. Improvement of WebGIS creation system using Leaflet. 29th Conference of GIS Association of Japan, October, Online. (in Japanese)
- Nemoto, Y. and Natsume, M. 2020. Expansion of the teaching materials and development of the tool for creating style of GIS data using Leaflet. *Proceedings of the General Meeting of the Association of Japanese Geographers 2020 Autumn Meeting* **98**: 150, October, Online. (in Japanese)
- Nodzu, M. I., Matsumoto, J., Seto, Y., Watanabe, T., Nakajima, K., Inoue, T., Hamada, J. I., Itou, Y. and Yanagisawa, T. 2020. Temperature-profile evolution in the surface boundary layer on a clear summer day, observed by an unmanned aerial vehicle. *Abstracts of the Meteorological Society of Japan 2020 Spring Meeting* **117**: 172, May, Preprint. (in Japanese)
- Saito, H. and Iijima, Y. 2020. Spatial distribution and magnitude-frequency distribution of thermokarst lakes in the middle basin of Lena River in Eastern Siberia. *Research Abstracts*

- on Center for Spatial Information Science, CSIS DAYS 2020: A10, November, Online. (in Japanese)
- Saito, H. and Iijima, Y. 2020. Spatial patterns and size-frequency distribution of thermokarst lakes in the middle basin of the Lena River. *Abstracts of the 11th Symposium on Polar Science: Sp11*, December, Online.
- Saito, H., Uchiyama, S., Hayakawa, Y. S. and Obanawa, H. 2020. Detection of landslides and vegetation recovery from multitemporal UAV and satellite images. *Abstracts of JpGU-AGU Joint Meeting 2020: U16-02*, July, Online.
- Suzuki, T., Chigira, M., Matsushi, T. and Nakayama, D. 2021. Assessment of earthquake-induced landslides potential on artificial landform transformation in the Tama Hills in a Volcanic Region. Disaster Prevention Research Institute, Kyoto University Annual Meeting 2021, February, Online. (in Japanese)
- Yasumoto, E. 2021. Simulation of evacuation behavior on fire using multi-agent model—A case study in Setagaya Ward—. 69th Meeting of Graduation Theses of Geography in FY2020, March, Online. (in Japanese)

5. Laboratory of Urban and Human Geography

1) Staff

Professor : Yoshiki WAKABAYASHI

Urban Geography, Behavioral Geography, Geographical Information Sciences

Associate Professor : Akihiro TAKINAMI

Regional Studies, Representation Studies

Associate Professor : Naoto YABE

Urban Geography, Quantitative Geography

Assistant Professor : Hiroyuki TSUBOMOTO

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
 - 1) Location of economic activities
 - 2) Human migration, commodity flow, and spatial diffusion of information
 - 3) Mental map and spatial behavior
 - 4) Time geography
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 FY2020

Peer-reviewed Articles

- Bettaieb, B. and Wakabayashi, Y. 2021. Comparison of the areas of interest in central Tokyo among visitors by country of residence using geotagged photographs. *Geographical Review of Japan Series* **93B**: 66-75. <https://doi.org/10.4157/geogrevjapanb.93.66>
- Hanibuchi, T., Yabe, N. and Nakaya, T. 2021. Who is staying home and who is not? Demographic, socioeconomic, and geographic differences in time spent outside the home during the COVID-19 outbreak in Japan. *Preventive Medicine Reports* **21**: 101306. <https://doi.org/10.1016/j.pmedr.2020.101306>
- Hirama, K., Yokota, K., Otsuka, Y., Fujimura, H., Watanabe, K. and Wachi, T. 2021. Examining factors explaining intra- and inter-offender variation in journey-to-crime distance, *The Japanese Journal of Behaviormetrics* **48**: 1-15. (in Japanese with English abstract)
- Koizumi, R. 2020. Development projects of Tokyo's reclaimed lands and their changes. *Annals of the Japan Association of Economic Geographers* **66**: 90-111. (in Japanese)
- Sugiura, Y. 2020. Walter Christaller under the versailles regime: between geometry and landschaft. *Urban Geography of Japan* **15**: 1-46. (in Japanese with English abstract)
- Suzuki., K. and U, Y. 2020. Quantitative analyses of chronological changes in types and spatial patterns of Paranormal events. *E-journal GEO* **15**: 55-73. (in Japanese) <https://doi.org/10.4157/ejgeo.15.55>
- Yabe, N., Hanibuchi, T., Adachi, M. H., Nagata, S. and Nakaya, T. 2021. Relationship between Internet use and out-of-home activities during the first wave of the COVID-19 outbreak in Japan. *Transportation Research Interdisciplinary Perspectives* **10C**: 100343. <https://doi.org/10.1016/j.trip.2021.100343>

Other Articles

- Koizumi, R. 2020. A study of residential area structure in Kawasaki City considering the period of urbanization. *The Monthly Bulletin of the Institute for Social Science Senshu University* **685**: 1-17. (in Japanese)
- Koizumi, R. 2020. Shitamachi and Yamanote. In *Geography of Tokyo*, ed. Kikuchi, T. and

- Matsuyama, H., 97-98. Tokyo: Asakura Publishing. (in Japanese)
- Susaki, S. 2021. The gay district as a place of residence for gay men and lesbians in Japan: The case of Shinjuku Ni-chome. *Geographical Reports of Tokyo Metropolitan University* **56**: 73-83.
- Wakabayashi, Y. 2020. Living in Tokyo. In *Geography of Tokyo*, ed. Kikuchi, T. and Matsuyama, H., 89-96. Tokyo: Asakura Publishing. (in Japanese)
- Wakabayashi, Y. 2020. Living in Tokyo. In *Geography of Tokyo*, ed. Kikuchi, T., Matsuyama, H., Sasaki, L. and Ranaweera, E., 89-96. Tokyo: Asakura Publishing.
- Wakabayashi, Y. 2021. Regional views and spatial thinking. In *How to learn the geographical reasoning*, ed. Kikuchi, T., 62-69. Tokyo: Ninomiya Shoten. (in Japanese)
- Yabe, N. 2020. Tokyo's economy. In *Geography of Tokyo*, ed. Kikuchi, T. and Matsuyama, H., 105-112. Tokyo: Asakura Publishing. (In Japanese)
- Yabe, N. 2020. Harajuku backstreets and fashion. In *Geography of Tokyo*, ed. Kikuchi, T., Matsuyama, H., 117-118. Tokyo: Asakura Publishing. (In Japanese)
- Yabe, N. 2020. Tokyo's economy. In *Geography of Tokyo*, ed. Kikuchi, T., Matsuyama, H., Sasaki, L. and Ranaweera, E., 105-112. Tokyo: Asakura Publishing.
- Yabe, N. 2020. Harajuku backstreets and fashion. In *Geography of Tokyo*, ed. Kikuchi, T., Matsuyama, H., Sasaki, L. and Ranaweera, E., 117-118. Tokyo: Asakura Publishing.
- Yabe, N. 2021. Looking and thinking about regions through Geographic Information Systems. In *How to study geography*, ed. Kikuchi, T., 126-133. Tokyo: Ninomiya Publishing. (in Japanese)
- Yui, Y., Miyazawa, H., Wakabayashi, Y. and Thang, L.L. 2021. Regeneration of housing estates by the community-based integrated care systems. In *Community-based integrated care and the inclusive society: Recent social security reform in Japan*, ed. Miyazawa, H. and Hatakeyama, T., 224-250. Singapore: Springer.

Books

None

Reports

None

Book Reviews

None

Miscellaneous Reports

- Araiori, T. 2020. Disease map and health crisis management of infectious disease. *GIS NEXT* **73**: 58-59. (in Japanese)
- Tsubomoto, H. 2020. Deploying the workplace model SOF to corporate FM. *JFMA JOURNAL* **198**: 96. (in Japanese)
- Tsubomoto, H. 2020. Office studies in geography and urban space perspectives. *JFMA JOURNAL* **199**: 46-47. (in Japanese)
- Wakabayashi, Y. 2020. Research frontiers of cartography and GIS looking through the ICC2019. *GIS NEXT* **71**: 58. (in Japanese)

Presentations

- Akutagawa, H. 2020. The marketing analysis about J-league by using mobile phone data. *Proceedings of the 29th Conference of GIS Association of Japan (CD-ROM)*: B25-3-2, October, Online. (in Japanese)
- Araiori, T. 2020. The information of health crisis management and risk communication in post corona society. *Proceedings of the General Meeting of the Association of Japanese Geographers* **98**: 69, November, Online. (in Japanese)
- Araiori, T. 2021. The role of epidemiological surveillance in disease map, The symposium of the special conference of Japan Cartographers Association 2020, Cartography of the COVID-19 pandemic: possibilities and problems. *Papers and Proceedings of the Special Conference of the Japan Cartographers Association 2020*, January, Online. (in Japanese)
- Bettaieb, B. and Wakabayashi, Y. 2020. Comparative analysis of spatial patterns of tourists' behavior in Japanese cities using online geotagged photographs. *Abstracts of JpGU-AGU Joint Meeting 2020*: HTT14-18, July, Online.
- Hirama, K., Yokota, K., Otsuka, Y., Wachi, T., Watanabe, K. and Yabe, N. 2020. A classification of the criminal distribution using Monte Carlo simulation. *Proceedings of the 48th Annual Meeting of the Behaviormetric Society*: 233, September, Online. (in Japanese)
- Hirama, K., Yokota, K., Otsuka, Y., Wachi, T., Watanabe, K., Hawaii, Y. and Yabe, N. 2020. Regional differences in Journey-to-crime distance, *Abstracts of 26th Meeting of Japanese Association of Forensic Science and Technology* **25**: 116, November, Online. (in Japanese)
- Saito, A., Tsubomoto, H., Sugano, F., Ishizaki, M. and Higa, F. 2020. A survey on intellectual productivity in the workplace using the "SOF Model" in 2020. *Journal of 21th JOS National Convention*: 36-39, September, Online. (in Japanese with English abstract)
- Tsubomoto, H. 2020. Prospects for offices in Tokyo in the corona virus disaster. *Proceedings of the General Meeting of the Association of Japanese Geographers* **98**: 76, November, Online. (in Japanese)

- U, Y. 2021. The network structure of package tour products visiting Toyama prefecture from Taiwan and Mainland China. *Proceedings of the General Meeting of the Association of Japanese Geographers* **99**: 75, March, Online. (in Japanese)
- Wakabayashi, Y. and Miyazawa, H. 2020. Visualization of the supply-demand gap in childcare services in Tokyo. *Abstracts of JpGU-AGU Joint Meeting 2020*: HTT14-17, July, Online.
- Wakabayashi, Y., Une, H. and Endo, H. 2021. Cartography of COVID-19: prospects and problems. *Papers and Proceedings of the Annual Conference of the Japan Cartographers Association 2020*, January, Online. (in Japanese)
- Yabe, N. 2020. Activity diary of dual income households in central and suburban Tokyo metropolitan area. The 29th Annual Meeting of the Geographic Information Systems Conference, October, Online. (in Japanese)
- Yabe, N., Hanibuchi, T., Nagata, S. and Nakaya, T. 2020. Interactions between out of home behavior and Internet usage before and after the Declaration of a State of Emergency. *Proceedings of the General Meeting of the Association of Japanese Geographers* **98**: 73, November, Online. (in Japanese)