



JAPAN SOCIETY FOR THE PROMOTION OF SCIENCE

**日本学術振興会**

## **JSPS Core-to-Core Program Interim Symposium**

**“A research hub of long-term forest monitoring field centers**

**on environmental changes and ecosystem responses:**

**Collaborating for data, knowledge and young researchers”**

6 March 2021

Organized by

The University of Tokyo Forests, The University of Tokyo

# **JSPS Core-to-Core Program Interim Symposium “A research hub of long-term forest monitoring field centers on environmental changes and ecosystem responses: Collaborating for data, knowledge and young researchers”**

**Date:** 6 March 2021

**Venue:** ~~Microsoft Teams~~ -> [Cisco Webex](#)

## **Organized by**

The University of Tokyo Forests, The University of Tokyo

## **Supported by**

Japan Society for the Promotion of Science

## **Program (Shown by JST = GST+9hrs)**

March 6 (SAT)

12:00 - 17:40      Symposium

12:00      Opening

12:05      Welcome Address

12:10      Interim Report by Research Group 1 (RG1)

01\_KURAJI, Koichiro (UTokyo)

12:30      Interim Report by Research Group 2 (RG2)

02\_KAMATA, Naoto (UTokyo)

025\_LARDIZABAL, Maria Lourdes T (UMS)

03\_ LI, Chun-lin (NTU)

04\_WU, Li-Wei (DongHai University)

12:50 Interim Report by Research Group 3 (RG3)

05\_OWARI, Toshiaki (UTokyo)

13:10 Invited Speech by SNU (Korea)

060\_PARK, Pil Sun

065\_IM, Sangjun

13:30 Invited Speech by NTU (Taiwan)

07\_GUAN, BT

13:50 Invited Speech by UTokyo (Japan)

08\_KAMATA, Naoto

09\_FUKUI, Dai (substituted by KAMATA)

14:10 Break

14:30 Invited Speech by KU (Thailand)

10\_WANTHONGCHAI, Kobsak

14:50 Invited Speech by UMS (Malaysia)

11\_PHUA, Mui-How

15:10 Invited Speech by HU (China)

12\_ZHANG, Hui

15:30 Invited Speech by UGM (Indonesia)

13\_RAHAYU, Sri

135\_SURYATMOJO, Hatma

15:50 Invited Speech by USJP (Sri Lanka)

14\_CHABDRATHILAKE, Thilak

15\_CHABDRATHILAKE, Thilak

16:10 Break

16:30 General Discussion

17:40 Closing

18:00 Social gathering (online)

### **Symposium**

This Symposium aims to discuss the strategy to obtain future funding opportunities including the 3rd phase of the same funding category offered by JSPS. On the 6th of March, invited speakers from core universities (SNU, NTU, KU, UMS, HU, UGM, USJP) and a core-candidate university (UFES) are kindly requested to present their FUTURE PLAN under the JSPS C2C Program. Fifteen (15) minutes for presentation and five (5) minutes for discussion will be provided to each university. The presentation from each university can be presented by more than one speaker if you can finish within the designated time.

### **General Discussion**

On the 6th of March in the late afternoon, we will discuss the following topics:

§ Strategy for the 3rd phase of JSPS C2C Program

§ Others

## **Welcome from the Dean of Graduate School of Agricultural and Life Sciences, The University of Tokyo**

It is my pleasure that I welcome you all to the Interim symposium of the research exchange project entitled “A research hub of long-term forest monitoring field centers on environmental changes and ecosystem responses: Collaborating for data, knowledge and young researchers”. This project was adopted for the Core-to-Core Program FY 2019 (B. Asia-Africa Science Platforms) by the Japan Society for the Promotion of Science. the Japan Society of Promotion of Science.

The Graduate School of Agricultural and Life Sciences, the University of Tokyo has led the research on agriculture, forestry and fisheries in Japan through about 145 years of education. Numerous research findings have been published and excellent graduates have been sent out in the society. We are very proud of our contribution to the development of the fields of sciences and industries, furthermore, to the improvement of human life in the world.

In recent years, global climate change has become increasingly evident and observable, with extreme climatic events frequently threatening human life and property. Actually flooding caused by strong typhoons has caused devastating damages to the Humankind is facing the major challenges of conserving the global environment. Agricultural and environmental science will play an increasingly important role in implementing technical and social measures toward this end. Hence, there is a strong need to elucidate the various functions of organisms, and to make the best use of the findings for society in the future. International education and collaborative research is the key to promote the use of agricultural and environmental science. I wish that all the participants will have fruitful discussions on global issues and extend your knowledge on forest environmental science.



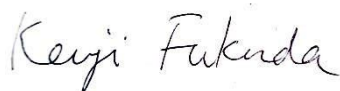
**Nobuhiro TSUTSUMI**

Dean of Graduate School of Agricultural and Life Sciences  
The University of Tokyo

## Welcome from the Director of the University of Tokyo Forests

It is a great honor of mine to invite you all to the Interim Symposium of the Core-to-core Program of the Japan Science Promotion Society (JSPS). Under the circumstance of COVID-19 pandemics, it is sad that I cannot see you in Japan. However, I am exiting to see many friends of mine in Asia online.

The University of Tokyo Forests have been used by a number of students and researchers as education and research stations for more than 125 years since the establishment of the University of Tokyo Chiba Forest in 1894. Chiba Forest has been accumulated growth data of Sugi plantaion for more than 100 years. Hokkaido Forest has been conducted selection logging in the natural forest also for more than 100 years. Since 1958, it has changed the management policy from high-value timber production to sustainable forest management and has accumulated the permanent plot data. Chichibu Forest has been oriented to researches on cool-temperate forest ecosystem in mountainous region. Tanashi Forest has about 9 ha of urban forest including secondary forest stands and nurseries for biological studies. Ecohydrology Research Institute rehabilitated denuded forestland and continued hydrology data collection during the process of vegetation recovery for more than 90 years. Fuji Iyashinomori Woodland Study Center has been used to study recreational usage of forests and now focusing on the healing effects of forests. Arboricultural Research Institute has introduced and studied fast-growing tree species and tropical woody plants which produce useful chemicals. All the seven forests have accumulated long-term climate data and have established long-term ecological research plots. These long-term datasets are treasures not only for forest and environmental sciences but also for human society under global climate change. In FY2016 the University of Tokyo Forests started networking university forests in Asia under the JSPS Core-to-core Program to tackle environmental issues. It is the second year of the second phase (FY2019-FY2021) of the project. I hope that this interim symposium provides a firm platform for further international collaboration among the university forests in the future.



Kenji FUKUDA  
Director of the University of Tokyo Forests



## Greetings from the project leader

It is my great pleasure to host the JSPS Core-to-Core Program Interim Symposium “A research hub of long-term forest monitoring field centers on environmental changes and ecosystem responses: Collaborating for data, knowledge and young researchers hosted by The University of Tokyo Forests. This symposium is organized under the Japan Society for the Promotion of Science (JSPS) Core-to-Core (C2C) Program (B. Asia-Africa Science Platforms) from 2019 to 2021.

The University of Tokyo Forests have more than 120 years history since the establishment of Chiba Forest in 1894, and have accumulated long-term data on tree growth, hydrology and ecology and collected biological specimens and records. It must be the case in other member universities. Nowadays, such long-term data are of most significant value in understanding the influence of global climate change to the forest ecosystem as well as to the human societies. Therefore, we have started the collaborative researches to share the monitoring data and to construct a strong international network for maintaining the long-term forest monitoring across Asia.

In the first phase of the JSPS C2C Program from 2016 to 2018, five Asian universities have constructed strong networks for collaborative researches. During the first phase, the project members from Korea, Taiwan, Thailand, Malaysia and Japan including professors, researchers, technical staffs and students have built a strong network and friendship within and across three research groups (RGs), and their collaboration bore fruits as many papers in journals and books.

In the second phase, Hainan University in China, Gadjah Mada University in Indonesia, and University of Sri Jayewardenepura in Sri Lanka joined the network. The kick-off symposium was hosted by Hainan University in November, 2019. The second symposium of the second phase was originally planned to be held at Universitas Gaja Mada in Indonesia in the last year 2020 and the interim symposium at UTokyo. However, because of the pandemic of COVID-19 spread all over the world since the last year, and we could not hold any international symposia until now. In these terrible days of COVID-19, however, we cannot stop our collaboration. I am so happy to be here today to be able to host the interim symposium on the internet.

Today, distinguished speakers are invited from core universities (Seoul National University, National Taiwan University, Kasetsart University, University Malaysia Sabah, Hainan University, Universitas Gadjah Mada, and University of Sri Jayewardenepura). I hope you will enjoy the symposium and find new seeds for collaborative researches.

鎌田 直人

Project Leader, The University of Tokyo Hokkaido Forest



## **Collaborative Research Activities within Asian University Forests: Interim Report by Research Group 1 (Water & Climate)**

Koichiro KURAJI<sup>1</sup>

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### **Abstract**

To determine the activity of the Research Group 1 (RG1) (Water & Climate) during the 2<sup>nd</sup> Phase of the JSPS Core to Core program, the 1<sup>st</sup> RG1 workshop was held in SNU in May 2019. RG1 Members from SNU, NTU, KU, UMS and UT were participated. In that workshop, we discussed about analytical methods of hydrological data and preparation of 4 manuscripts for journal papers. As a result, two of the 4 manuscripts were submitted to the JFR special issue and published. At the 1<sup>st</sup> JSPS C2C Symposium in HU in November 2019, 8 papers from SNU, NTU, KU, UMS, HU, UGM, USJ and UTF were presented. In addition, a RG1 meeting and excursion was held in the Arboricultural Research Institute (ARI), UTF in February 2020. A special issue of “Water” (open access journal; ISSN 2073-4441) entitled "Long-Term Monitoring and Research in Forest Hydrology: Towards Integrated Watershed Management" was proposed as one of the choices for RG1 members to submit their papers in September 2019 and I am the Guest Editor of this special issue. The deadline for manuscript submissions is 20 March 2021 and 4 papers (three of them were written by the RG1 members) has been published as of 26 February 2021. In the fiscal year 2020, RG1 online meeting was held two times in October 2020 and January 2021 instead of the onsite workshop. As a result of discussion, the participants decided to publish a booklet entitled “Experimental Watersheds and Weather Stations in Asian University Forests Consortium” from the University of Tokyo Press not later than December 2021. The editors are Dr. Tanaka (UTokyo), Prof. Sangjun Im (SNU), Dr. Yen-Jen Lai (NTU), Dr. Venus Tuankruea (KU), Dr. Maznah Mahali (UMS), Prof. Zhang Hui (HU), Dr. Hatma Suryatmo (UGM), and Dr. Thilakawansha Chandrathilake (USJ)).



## **Collaborative Research Activities within Asian University Forests: Interim Report by Research Group 2 (Biology & Ecology)**

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### **Abstract**

There are two major activities in the RG2. The first is analysis on the long-term phenology data that has been obtained by the University of Tokyo Hokkaido Forest (UTHF) since 1931. I myself archived the data in 2018 and published it as a data paper in Miscellaneous Information of the University of Tokyo Forests (MIUTF). KAMATA and others published other two papers using the phenology data of UTHF and those of the University of Tokyo Chichibu Forest (UTCF). Professor Bing-Tzuang GUAN stayed about three months at the UTHF and analyzed the data with me and my student, Mr. Keisuke NONAKA. In the process, we needed to estimate missing values by multiple regression using climate data that Dr. Nobuaki TANAKA calibrated. The manuscript is now challenging for publication. The second is bark and ambrosia beetle project. KAMATA has been collected these beetles by ethanol-baited traps and bait logs or branches for three years (78 sampling times) in Thailand (2012–2014; local collaborators (LC): Drs. Sawai BURANAMANICHPAN, Teerapong SAOWAPHAK, and Sunisa SANGUANSUB), Malaysia (2017–2020; LC: Drs. Maria Lourdes T. LARDIZABAL and Wilson WONG), and Taiwan (2019-ongoing, LC: Drs. Chun-Lin LI and Li-Wei WU). We held a workshop SEP 9–14, 2019 at National Taiwan University, Experiment Forest by including seven students from UTokyo and UMS. Dr. Sri RAHAYU, Dr. Shuhei TAKEMOTO, Dr. Dai KUSUMOTO collaborated with me to test virulence of *Raffaella quercivora*, a pathogen of the Japanese oak wilt, to oak species in Indonesia 2016–2019. We found that the plants in Indonesia was more highly resistant against *R. quercivora*. We finished the data analysis and now preparing manuscript for a journal paper. Prof. Il-Kwon PARK has also conducting similar bait trapping in Korea. We are discussing to compare the data in future. SUANGUANSUB and others published a data paper of ethanol-baited trapping in MIUTF and another journal paper in the special issue of this project in JFR. KAMATA and others also analyzed long-term trapping data of bark and ambrosia beetles at UTCF and published one paper in the same special issue.

## **Interim Report by Research Groups (RG) 2: Bark and ambrosia beetle project**

Naoto KAMATA<sup>1</sup>, Maria Lourdes T. LARDIZABAL<sup>2</sup>, Wilson WONG<sup>2</sup>, Stephany SELVISTER<sup>2</sup>, Anastasia RASIAH<sup>2</sup>, Sandra Georgina GEORGE<sup>2</sup>, Tyrone MOJIKON<sup>2</sup>, Evahtira GUNGGOT<sup>2</sup>, Haoen WONG<sup>2</sup> & Jonathan Jimmey LUCAS<sup>2</sup>

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### **Abstract**

The bark and ambrosia beetle project in Sabah was established to obtain and collect information on bark and ambrosia beetle species in the lower montane forest of South West Borneo. The project was spearheaded by Prof. Dr. Naoto Kamata with Dr. Maria Lourdes T. Lardizabal and Dr. Wilson Wong as the local collaborators in-charge. The project was conducted for a three-year period, which commenced on April 29, 2017 and ended on May 30, 2020. Sampling of beetle specimens were carried out at Ulu Padas Forest Reserve, Sipitang, Sabah, near the village of Long Mio. Two methods of sampling were implemented in this study, which included the “baitlog” method and the “ethanol bait trap” method. Stephany, Tyrone and Haoen were involved in the “baitlog” sampling while Anastasia, Sandra, Evahtira and Jonathan conducted the “ethanol bait trap” sampling. The project conceived seven theses from four generations of undergraduate final year students who were involved in the study. Five students (Stephany, Anastasia, Sandra, Tyrone and Evahtira) were also given the opportunity to do their internship at The University of Tokyo Hokkaido Forest, Hokkaido, Japan. So far, data collection has been completed while some specimens are still in the process of identification with help from Dr. Roger Beaver, an expert in bark and ambrosia beetle taxonomy from Thailand.

## **Bark and ambrosia beetles survey using ethanol baited traps in a subtropical *Zelkova* plantation in central Taiwan**

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### **Abstract**

Considering the economic and ecological importance of bark and ambrosia beetles (Coleoptera: Curculionidae: Scolytinae) potentially affected the health of forests, we conducted a survey on beetles using ethanol baited traps set up along two transect lines in a *Zelkova* plantations in Heshhe of central Taiwan throughout 2019. A total of 2,285 specimens in 32 species were collected with the most dominant species, *Xylosandrus mancus* (Blandford, 1898), in total of 1,105 specimens (approximately 48.4% of the whole). The secondary dominant species collected by ethanol baited traps were *Phloeosinus pertuberculatus* (Eggers, 1939) with 607 specimens (26.6%). Two of them above-mentioned were accounted for 75% of the total beetle specimens with 12 species which were obtained less than five specimens, respectively. Flight period for bark and ambrosia beetles depend on species with higher number of appearance of adults in dry season than in wet season. The lower transect line has higher number of beetle specimens (77%) obtained than higher one (23%) which is likely due to a more thinning tree canopy in lower trapping line than in higher one.

## **Species diversity of bark and ambrosia beetles in Asia**

Li-Wei Wu <sup>1</sup>, Chun-Lin Li <sup>2</sup>, Ming-Jr Tsai <sup>2,3</sup>, and Naoto Kamata <sup>4</sup>

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2 The Experimental Forest, National Taiwan University

3 School of Forestry & Resource Conservation, National Taiwan University

4 The University of Tokyo Hokkaido Forest, the University of Tokyo Forests,  
Graduate School of Agricultural and Life Sciences, the University of Tokyo

### **Abstract**

Temperate forests are severely damaged by introduced bark and ambrosia beetles, and the most important strategy is to identify which species it is and to do pest control. However, bark and ambrosia beetles are highly diverse and it is not easy to identify them based on morphological characters, and even barcode sequences are hard to sequence because trapped samples were placed in the field for a long time and the DNAs were fragmented into small pieces. The purpose of this project is to establish a mitogenomic database of bark and ambrosia in Asia. This database is used not only for correct identification, but also for investigating host-insect relationships to find out the invasive processes. Total 58 specimens were successfully extracted, sequenced and assembled into mitogenomes, even the DNA quality is fragmented below 250 bp. Our preliminary work presents strong relationships among the bark and ambrosia of Asia, and this technology even can apply on single and small beetle. In the next year, we would like to sequence more sample to investigate the relationships between insects and host plants.

Keywords: meta-genomics, next-generation sequencing, beta diversity.

# **Collaborative Research Activities within Asian University Forests: Interim Report by Research Group 3 (Sustainable Management)**

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## **Abstract**

Among three Research Groups (RGs) under the Japan Society for the Promotion of Science (JSPS) Core-to-Core Program, RG3 (Sustainable Management) deals with anthropogenic interventions in Asian forests, long-term geospatial and management data, and ecosystem services associated with social, economic and cultural values. International collaborative research activities have been promoted by core universities in eight Asian countries (Japan, Korea, Taiwan, Thailand, Malaysia, China, Indonesia, and Sri Lanka). First of all, we updated the list of major long-term experimental plots across core universities. In November 2019, we organized an RG3 session at the 1st International Symposium of Long-term Forest Monitoring Research in Asia that took place in Haikou, China, where 9 speakers from core universities presented their research findings. Our group made a significant contribution to the Special Feature of the Journal of Forest Research, in which four articles were published in the research field of forest growth and mensuration based on long-term plot measurement and remote sensing data. Although our collaborative research activities mainly related to the experimental plots of old Sugi (*Cryptomeria japonica*) plantations, research cooperation targeting various forest types is required to win the next term of the JSPS Core-to-Core Program.

# **Past, Present, and Future of Seoul National University Forests, Korea - A Bridge between Science and Society**

Pil Sun PARK<sup>1,2</sup>, Sangjun Im<sup>1,2</sup>

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## **Abstract**

Seoul National University Forests (SNUFs) was established in 1913 to support forest education and research. Later, the mission of SNUFs enlarged to conserve forest ecosystem and biodiversity, demonstrate forest management models and contribute to local communities. SNUFs consist of three regional forests in central and southern regions of Korea, with a total area of 17,126 ha. Three regional forests are Chilbosan University Forest which is located in Suwon, Taehwasan University Forest in Gwanju, and Nambu University Forest which is located across Gwangyang and Gurye.

The current mission of SNUFs are to: 1) support forest field education, 2) conduct experimental and research activities, 3) manage university forests by planning, regeneration, tending, intermediate cutting, and harvest, 4) conserve forest ecosystem and biodiversity, 5) demonstrate advanced technologies for sustainable forest management, and 6) provide ecosystem services to local communities. Various university classes are conducted in SNUFs including taxonomy, tree physiology, forest entomology, wildlife, forest ecology, silviculture, forest engineering, and forest management.

SNUFs face new challenges posed by regional, national, and global issues, such as climate change, carbon sequestration, biodiversity, and forest disturbances. Long-term and intensive monitoring programs have been conducted to look for best answers to scientific questions over the past few decades.

SNUFs has increased forest extension programs to enhance the understanding of forest and environmental issues for local communities and to meet the need of locals. Forest camps for young students, professional programs for forest practitioners, and a forest exploration program for the general public are good examples of public service efforts of SNUFs.

University forests used to focus on university education and research, demonstrating new technologies for forest management, however, the role of university forest in local communities and its public service have become important, especially in the 21<sup>st</sup> century. With increasing need from local communities, the role and efforts of university forests to connect academia and public are required to broadcast forest values to public beyond the academics.

# Preliminary Testing of Soil Micromorphology for Analyzing the Soil Pore Structures in Soil-Ash Mixture

Sangjun IM<sup>1,2</sup>, Qiwen LI<sup>1</sup>, Jeman LEE<sup>1</sup> & Taehyun KIM<sup>1</sup>

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## Abstract

Soil pore structure is the inherent property of soil matrix that can govern the hydrologic processes of soils such as infiltration rate, hydraulic conductivity and water retention capacity. Many hydrologists have commonly used the apparent porosity of soil profile to represent the soil's ability in the research of soil hydrology, because accurately quantifying the interparticle porosity of soils is still a challenge. With the advent of new technologies, soil micromorphology allows the reliable analysis of the pore geometry and sizes in soil matrix. In this study, the size and distribution of soil pores were visualized from digital images of soil sample, where were hardened by resin impregnation technique. This technique was further applied to soil-ash mixture to verify the potential use of proposed method. A rainfall simulation was conducted to plug ash particles through soil macropores, and then resin impregnation was done by replacing pore spaces with resin. After hardening, soil samples were cut and gently grinded for taking digital photos of soil sections directly. ImageJ is an open source image processing program and employed in this study in order to analyze the fluorescent images of soil blocks. The results showed that the soil micromorphology can quantify the soil pore space, ash and soil particles in soil matrix with acceptable accuracy.

## Summary of Past Achievements and Future Activities of National Taiwan University Experimental Forest in the JSPS-C2C Project

Biing T. Guan<sup>1</sup>, Ming-Jer Tsai<sup>2</sup> & Yen-Jen LAI<sup>3</sup>

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### Abstract

In 2020, despite the COVID-19 pandemic, researchers in National Taiwan University Experimental Forest actively participated in the JSPS C2C project. We have contributed four papers in the Journal of Forest Research Special Issue on “Long-term Monitoring and Research in Asian University Forests: Towards Further Understanding of Environmental Changes and Ecosystem Responses,” and one member served as a guest editor of the special issue. In RG1, our researchers participated two video conferences and discussed with the member institutions about future cooperation on water resource assessments. In RG2, we collaborated with the University of Tokyo Hokkaido Forest to impute missing phenological data and identify their trends since the early 1930s. We also started collaboration on tropical forest biodiversity with Universiti Malaysia Sabah. In RG3, our researchers discussed possible joint projects with the University of Tokyo Chiba Forest to study *Cryptomeria japonica* growth and yield under climate warming and verify thinning effects on promoting carbon sequestration. In 2021, besides continuing the current research collaboration, National Taiwan University Experimental Forest will host the 9<sup>th</sup> Symposium of Asian University Forest Consortium when the situation permits.



**Population dynamics of the beech caterpillar, *Syntypistis punctatella* (Motschulsky) in Northern Japan: Future collaboration with Hui Zhang at Hainan University**

Naoto KAMATA<sup>1</sup>

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**Abstract**

The beech caterpillar is a monophagous moth species, of which larva feeds on only the genus *Fagus*. *S. punctatella* is endemic to Japan so that its food plants are two beech species, *F. crenata* and *F. japonica*. *S. punctatella* causes intensive defoliation to *F. crenata* when its density increases and reaches outbreak level. The outbreaks tends to occur at an interval of about 10 years. Its density of *S. punctatella* fluctuate with a magnitude of 4<sup>th</sup> order. Time-delayed density-dependent mortality caused by fungal diseases are the main cause of the population cycle. An entomopathogenic fungus, *Cordyceps militaris* plays the most major role among these. Until early 1990s, the population outbreaks tended to occur synchronously among disjunct regions. However, thereafter population dynamics was desynchronized. Recently the phases of the population cycles are completely reversed within northern Japan. Prof. Hui Zhang will work with my data in future.

# Wild Mammal Monitoring Using Camera Traps

Dai Fukui<sup>1</sup>

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## **Abstract**

Forests are an important habitat for many mammal species. Since mammals are sensitive to forest environment changes, their fauna and activity are thought to reflect the forest environment. On the other hand, mammals are a taxonomic group that is difficult to observe directly, making ecological studies difficult. Camera trap is useful method to know and monitor middle- and large-sized mammal fauna. In this presentation, I propose wild mammal monitoring using camera traps. If you are interested in this proposal, please contact Dai Fukui.

**FACULTY OF FORESTRY (KUFF)**  
**“ACTIVITIES AND FUTURE COLLABORATION**  
**IN KUFF RESEARCH AND TRAINING STATIONS”**

Kobsak WANTHONGCHAI<sup>1</sup>, Dokrak MAROD<sup>1</sup>, Venus TUANKRUA<sup>1</sup>  
& Narinthorn JUMWONG<sup>1</sup>

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**Abstract**

Kasetsart University, faculty of forestry (KUFF) has 8 research and training stations covering most of forest ecosystem in Thailand. Each station has unique in terms of ecosystem and infrastructure for supporting research and training. "Doi Pui" and "Wang Nam Khiew" research station have long been serving for watershed management and long term ecosystem study with University Forest Consortium group, respectively. These are related to the group of RG 1 (Doi Pui) and RG 2 (Wang Nam Khiew ) of the University Forest Consortium. “Doi Pui” has carried out a long-term study on microclimate and forest hydrology, however, we lack continuous operation. We are seeking for cooperation from to continue meteo-hydrological research, including instruments. Research activities at Wang Nam Khiew site is on track, that KUFF will support continuously. However, the RG 3 research group, of which focusing on forest management, is not much well promoted and activated. In this regards, KUFF would like to propose "Sanam Chai Khet" research and training station to be the research site for RG3 group, especially for those researchers who are interested in economic forest management. Economic forest plantation research that meet the “sustainable forest management scheme” will be promoted and implemented. In addition, Wang Nam Khiew site may be considered for RG3 research activities too, particularly in the management of dry deciduous forest for SDGs with nearby local communities. Therefore, KUFF are very welcome the University Forest Consortium members to join with our mission in this research station.

# **Universiti Malaysia Sabah Forestry: An Overview on Education and Research**

Mui-How PHUA, Wilson V. C. WONG, Maria Lourdes LARDIZABAL & Maznah MAHALI

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## **Abstract**

Forestry programmes in Universiti Malaysia Sabah (UMS) was founded in 1996 with the establishment of School of International Tropical Forestry (SITF) and introduction of four Bachelor of Forestry Science programmes (i.e. International Tropical Forestry, Nature Park & Recreation, Forest Plantation & Agroforestry, and Wood Technology & Industry. Recently, efforts to establish a new faculty, namely the Faculty of Tropical Forestry, have been undertaken by including the Conservation Biology Program into the existing programs. UMS emphasizes field-based and practical activities in forestry education. Beside of field learning in the programmes' courses, students are exposed to field learning in a two-week forest camp, conducted in the UMS Kota Kinabalu Campus and state's forest reserves and parks. In the final semester, students learn through industrial attachment in private companies, government agencies or non-governmental organizations, nationally or internationally. International collaborations are important to forestry education and research in UMS in the context of industry and society. Research collaborations with researchers from core universities in the Core-to-Core program have been conducted in various forest areas in Sabah such as Long Mio and Crocker Range Park. Various plans are proposed to strengthen the existing collaborations as well as to establish new collaborations.

# Time-series data analyses on 35-year data of the beech caterpillar, *Syntypistis punctatella* (Motschulsky)

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## Abstract

Since the kick-off symposium in Furano, Hokkaido, Japan in Oct. 2016, we tried to start Generally, commonly used statistics analysis cannot be fit for analyzing time-series data. Thus, here I aim to introduce two types of time-series data analysis methods for analyzing Kamata SenSei's long times' data on population dynamics of beech caterpillar. One is wavelet analysis, which is used to test the interrelationships among population dynamics for beech caterpillar, beech, and bird and climate change parameters. The other is a newly developed algorithm PCMCI which shows prefect adaptations and accuracies whether the data series is linear or non-linear. Also, it can find the most likely time lag of causality between variables. Specifically, I will use two examples to show how to perform these two types of time-series data analysis in detail..

# **Forestry Research Activities and Future Collaboration on Long Term Monitoring Plot of KHDTK Getas, Faculty of Forestry, Universitas Gadjah Mada (UGM)**

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## **Abstract**

Faculty of Forestry UGM received a tenurial right on 10,901 hectares of forest from the Ministry of Environment and Forestry of Indonesia (MoEF) in 2016. The forest, which later established as a Special Purpose Forest Area (KHDTK) UGM by MoEF, located in Blora (Central Java) and Ngawi Regency (East Java). One of the programs in the KHDTK Getas is Integrated Forestry and Farming System (IFFS) combining the clonal teak and crop plantation to accelerate degraded forest recovery, carbon sequestration, and improve livelihood and food security of village households. Furthermore, more than 50% of the area will be dedicated to the development of clonal teak (*Tectona grandis*) which support the long-term monitoring of hydrological, silviculture treatments growth and yield, and health of Teak in the monsoon forest. Several of our early studies in KHDTK Getas will be presented during this symposium. We kindly invite all of this network's members to conduct a research collaboration in KHDTK Getas.

# Long-term Hydrometeorology Monitoring in the Tropical Mountainous Watershed

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## Abstract

One of the common forms of land-use change in humid tropical regions is the clearance of ground vegetation in association with timber harvesting, agricultural cultivation, mining, residential, and recreational development. Reductions in vegetation cover from forest generally change the hydrologic response by increasing the average surface runoff volume and sediment yield for a given area of land. Land-surface modification that involves the removal of vegetation cover severely alters near-surface hydrologic processes and accelerates surface runoff, erosion, and landslide, potentially resulting in a variety of on- and off-site consequences such as reduced site productivity, the degradation of downstream water/habitat quality, and changes in channel morphology. The aim of this research is to investigate the hydrological changes of Karangobar catchment between forested, agroforestry, and intensive-farming catchments in the upstream area of Merawu watershed. Runoff, soil erosion and water quality investigations conduct in the 6 small catchments. Community assistance, education, training and conservation plots used to increase the community awareness of the sustainable environment in the upstream area of Merawu watershed.

Keywords: land-use change, landslide, intensive farming, runoff, erosion, water quality

# Characteristics of Stemflow generation by Seven Urban Tree Species in University of Sri Jayewardenepura, Sri Lanka

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## Abstract

Stemflow (SF) generation of urban environment in single rain events are less frequently reported. Thus, this research aimed to study SF generation of urban forest trees in University of Sri Jayewardenepura, Sri Lanka. Stemflow of 21 individual trees belongs to seven species were quantified from August to November 2019 by installing collars at diameter at breast height (DBH). Tree height, DBH, canopy height, canopy diameter, canopy volume, and canopy diameter to height ratio, bark thickness, furrow depth and number of furrows per DBH were considered as tree morphological characteristics. Tree architectural models were also determined by leaf shape, leaves arrangement and canopy shape. Twenty individual rain events starting from dry canopy condition were analysed. According to the results, all species produced SF when rainfall (RF) exceed 4 mm. Strong positive correlation was observed in-between SF and RF for all species. The highest and the lowest SF were generated by *Filicium decipiens* and *Pterocarpus marsupium* Roxburgh respectively. DBH, canopy volume and bark thickness were showed negative relationship with SF. The rest of tree morphological characteristics and tree morphological characters were not significantly influenced on SF for all species. The findings of the study will be important for urban forestry, specially for surface runoff management.

**Key words:** Funneling ratio, Stemflow, Tree morphology, Urban environment



# Paired watershed delineation and identification of its morphological features in Yagirala Forest Reserve, Sri Lanka

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## Abstract

The department of Forestry and Environmental Science (DFES) of University of Sri Jayewardenepura is promoting education and research in the Yagirala Forest Reserve (YFR) since it is the only University which maintains a forest for the education and research purpose in Sri Lanka. As an addition to the existing research facilities, the department intends to establish a paired watershed (WS) with water gauging facility for long-term hydrological monitoring. This is timely important since there are no such a long- term hydrological monitoring watersheds available in the field of forestry in Sri Lanka. Therefore, this study aims to identify and delineate paired watershed in YFR. By using manual and automated approaches two watersheds (WS1 located in forest enriched with *Pinus caribaea* and the WS2 in natural forest). were delineated. Both watersheds are smaller in size with elongated and oval in shape respectively. Important morphological characteristics such as axial length, perimeter, form factor, circulatory ratio, elongation ratio, basin slope, stream frequency, stream density. Stream texture and overland flow for both watersheds were determined using ArcGIS. In conclusion, delineation of paired watershed and estimation of its morphological analysis in YFR provides a prerequisite for advanced forest hydrological studies in tropical lowland rain forest in Sri Lanka.

**Keywords:** *paired watersheds, watershed morphology, watershed delineation, Yagirala Forest Reserve, GIS, DEM,*