

A summary of the 21st IHP training course on “Introduction to River Basin Environment Assessment under Climate Change”

1. Outline

A short training course on river basin environment assessment under climate changes will be programmed for participants from Asia-Pacific regions as a part of Japanese contribution to the International Hydrological Program (IHP). The course composed of a series of lectures and practice sessions and field surveys along the Kamo River will be held mainly at Disaster Prevention Research Institute (DPRI), Kyoto University during the two weeks from 28 November to 9 December 2011.

2. Objectives

It is obvious that climate changes in recent decades influences the hydrological behavior and its corresponding environments in river basins. Thus, a numerical evaluation based on the model accurately expressing natural reactions is necessary. In simulating the river basin environments subject to past, present and future climate changes, we need to have an indisputable and integrated model incorporating some eco-hydrological/eco-hydraulic and hydro-chemical processes into hydrological/hydrometeorological ones. We have to immediately consider the full impacts of climate changes on river basin environments to conduct the river basin management. The above full impact is quite difficult to grasp because the actual system of river basin environments is too complicated to built up the accurate models of coupling reactions among hydrological, environmental and ecological events. We can, nevertheless, model and simulate the individual component models as a numerical system. A numerical simulation using appropriate modelling for hydrological, environmental and ecological behavior under climate changes is a powerful, useful and helpful approach to grasp a spatiotemporal distribution of water resources, environmental assessments and biomass.

The 21st IHP training course is focused on three major objectives: (1) to acquire the latest knowledge on hydrological and environmental assessment under climate changes at river basin scale in the Asia-Pacific region, (2) to make practice for selected topics on successful simulations to make use of the river basin environment assessment, and (3) to discuss the possibility to apply the river basin environment assessment into some hydrological and environmental managements.

3. Course Contents (convener: Tetsuya Sumi, Chief assistant: Toshio Hamaguchi)

3.1 Lecturers

HAMAGUCHI, Toshio (Disaster Prevention Research Institute, Kyoto University)
 ICHIKAWA, Yutaka (Dept. of Civil and Environmental Engineering, Yamanashi University)
 KAWAGUCHI, Tomoya (Nihon Suido Consultants, Co., Ltd.)
 KUZUHA, Yasuhisa (Graduate School of Bioresources, Mie University)
 SATO, Yoshinobu (Disaster Prevention Research Institute, Kyoto University)
 SHIIBA, Michiharu (Graduate School of Engineering, Kyoto University)
 TAKEMON, Yasuhiro (Disaster Prevention Research Institute, Kyoto University)
 TANAKA, Kenji (Disaster Prevention Research Institute, Kyoto University)
 TOKAI, Akihiro (Graduate School of Engineering, Osaka University)
 TSUJIMURA, Maki (Graduate School of Life and Environmental Sciences, University of Tsukuba)

3.2 Lectures at Obaku Plaza in Uji Campus, Kyoto University

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| (1-1) Basin-scaled Hydrological Processes | M. Shiiba |
| (1-2) A simple model for evaporation from bare land or water body | Y. Kuzuha |
| (1-3) Basin scale runoff | Y. Ichikawa |
| (1-4) Basin-scaled groundwater processes | M. Tsujimura |
| (1-5) Application of Satellite Remote Sensing Product on Hydrological Processes | K. Tanaka |
| (2-1) Case Study of Basin Wide Environmental Quality Assessment Based on the Distributed Runoff Model | A. Tokai |
| (2-2) Habitat Structure Assessment for Riverbed Management under Climate Change | Y. Takemon |
| (2-3) Lake Ecological Environmental Assessment from Eutrophication with a Regime Shift | T. Kawaguchi |

3.3 Practices

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| (3-1) Practice for Runoff Processes: Integrated Hydrological Model for River Basin Environment and Ecosystem Assessment | Y. Sato |
| (3-2) Numerical Exercise of Groundwater Flow with Moving Boundaries in Two Dimensions | T. Hamaguchi |
| (3-3) Phenology Analysis of NDVI | K. Tanaka |
| (3-4) Measurement of hyporheic habitat conditions of gravel bar for aquatic animals | Y. Takemon |

3.4 Technical visits and field surveys

Visits to Uji River, Lake Biwa Museum, Amagase Dam, and etc.

3.5 Schedule (28 November to 9 December, 2011)

27 (Sunday)		Arrival at Kansai Airport and movement to Kyoto
28 (Monday)	14:00-16:30	Registration & Guidance
	17:00-19:00	Welcome party
29 (Tuesday)	9:30-12:00	Lecture 1-4 by M. Tsujimura
	14:00-16:30	Lecture 1-2 by Y. Kuzuha
30 (Wednesday)	9:30-12:00	Practice 3-2 by T. Hamaguchi
	14:00-16:30	Practice 3-2 by T. Hamaguchi
1 (Thursday)	9:30-12:00	Lecture 1-3 by Y. Ichikawa
	13:30-16:00	Lecture 2-1 by A. Tokai
2 (Friday)	9:30-12:00	Lecture 2-2 by Y. Takemon
	13:15-15:45	Lecture 2-3 by T. Kawaguchi
3 (Saturday)	9:30-16:30	Technical visits to Lake Biwa Museum and Amagase Dam along the Uji River
4 (Sunday)		Day off (Culture-understanding trip to Arashiyama.)
5 (Monday)	9:30-12:00	Lecture 1-1 by M. Shiiba
	14:00-16:30	Lecture 1-5 by K. Tanaka
6 (Tuesday)	9:30-12:00	Practice 3-1 by Y. Sato
	14:00-16:30	Practice 3-1 by Y. Sato
7 (Wednesday)	9:30-12:00	Practice 3-3 by K. Tanaka
	14:00-16:30	Practice 3-3 by K. Tanaka
8 (Thursday)	9:30-16:30	Practice 3-4 by Y. Takemon
9 (Friday)	9:30-11:00	Making a report and having a presentation
	11:00-12:00	Completion ceremony of this course
	12:00-14:00	Farewell party with lunch
10 (Saturday)		Departure from Kansai Airport

*Lectures and practices are held mainly at Seminar Room 1 of Obaku Plaza in Uji Campus of

Kyoto University. Refer the following site for access and map of the Uji Campus.

<http://www.uji.kyoto-u.ac.jp/english/04access&maps.html>

**Accommodation for the formal participants: ELL IN KYOTO.

<http://www.elinn-kyoto.com/en/>

4. Participants

The training course participants consist of 8 trainees, seven from eastern and southeastern Asian countries and 7 students currently at Ph.D. or Master program of GCOE-ARS, Kyoto University. 4 students in other programs of Kyoto University participate only in the lectures as auditors. The background of the participants is quite diverse: they come from all different countries (Mongolia, South Korea, Philippines, Thailand, Indonesia, Malaysia, Myanmar, Nepal, Vietnam, India, Cambodia and Brazil). One of the foreign participants (from Egypt) is research staff at the university.

5. Downloading the Textbook and Web broadcasting

The textbook of “the 21st IHP Training Course”, which is converted in PDF style, was prepared on the IHP Nagoya forum website of "www.ihpnagoyaforum.org". The participants were able to download such PDF files from the website in advance as a preparation to the several lectures of the training course. The textbook is constituted of contents (referred sentence bodies, figures, tables, pictures, equations and observed/calculated results) with authorized copyrights. After this course, everybody will be able to see the textbook file on the UNESCO website.

The lectures with the exception of field trips were broadcasted to some universities in Asia via the UNESCO Jakarta Office and with other technology through DPRI facilities from the internet.

6. Participants Skill and Reactions

The participants were eager at classes to learn. They had many questions to ask and the lecturers did not mind extending their two-hour class to answer the questions. In the practices, the participants were able to learn how to make and use input data, how to visualize their results of the numerical calculation assignments to be given and how to interpret the visualized results. Some were proficient in computer programming, while others seemed not as experienced with computers. Such diversity in computer skill among the trainees was dealt with by supporting staff helping the lecturer by individually answering questions from the participants. All the participants were quite diligent and punctual throughout the training course.