



International Hydrological Programme

**Water Resources and Water-Related Disasters  
under Climate Change  
- Prediction, Impact Assessment and Adaptation -**

The Nineteenth IHP Training Course

29 November to 12 December 2009

Kyoto, Japan

Hydrospheric Atmospheric Research Center, Nagoya University

Water Resources Research Center, DPRI, Kyoto University

Global COE Program (GCOE-HSE) “Global Center for Education and Research on

Human Security Engineering for Asian Megacities”, Kyoto University

Global COE Program (GCOE-ARS) “Sustainability/Survivability Science for Resilient Society Adaptable to Extreme Weather Conditions”, Kyoto University



## **Outline**

A short training course on water resources and water related disasters under climate change 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, practice sessions and technical visits will be held mainly at Disaster Prevention Research Institute (DPRI), Kyoto University during the two weeks from 29 November to 12 December 2009.

## **Objectives**

Global climate change has become an inevitable issue in the fields on water resources and hydro-hazards since the recent climate change has an obviously inclination to increase frequency of extreme phenomena including severe drought and unprecedented flood. We need, therefore, to notice the regional trends of climate change, to predict and assess the future status of water resources and hydro-hazards, and to adapt our social system to such uncertain conditions.

The 19<sup>th</sup> IHP training course is focused on three major objectives: (1) to learn recent knowledge on water resources and water related disasters under climate change in Asia-Pacific regions, (2) to make practice for selected techniques on prediction and assessment of global, regional and/or local changes in hydrological systems, and (3) to discuss strategies of adaptation to resultant hydrological systems under the climate change including efforts for problem prevention and mitigation with respect to irreplaceable water resources.

## **Course Contents (convener: Toshiharu KOJIRI)**

### **Lecturers**

FUJITA Masaharu (Disaster Prevention Research Institute, Kyoto University)  
HAMAGUCHI Toshio (Disaster Prevention Research Institute, Kyoto University)  
HORI Tomoharu (Disaster Prevention Research Institute, Kyoto University)  
KIDO Yoshinobu (Disaster Prevention Research Institute, Kyoto University)  
KOJIRI Toshiharu (Disaster Prevention Research Institute, Kyoto University)  
KOZAN Osamu (Center for Southeast Asian Studies, Kyoto University)  
MASE Hajime (Disaster Prevention Research Institute, Kyoto University)  
MORI Nobuhito (Disaster Prevention Research Institute, Kyoto University)  
NAKAGAWA Hajime (Disaster Prevention Research Institute, Kyoto University)  
NAKAKITA Eiichi (Disaster Prevention Research Institute, Kyoto University)  
SATO Yoshinobu (Disaster Prevention Research Institute, Kyoto University)  
SUMI Tetsuya (Disaster Prevention Research Institute, Kyoto University)  
TACHIKAWA Yasuto (Graduate School of Engineering, Kyoto University)  
TAKARA Kaoru (Disaster Prevention Research Institute, Kyoto University)  
TAKEMON Yasuhiro (Disaster Prevention Research Institute, Kyoto University)  
TANAKA Kenji (Disaster Prevention Research Institute, Kyoto University)  
TODA Keiichi (Disaster Prevention Research Institute, Kyoto University)  
YAMASHIKI Yosuke (Disaster Prevention Research Institute, Kyoto University)  
YASUDA Tomohiro (Disaster Prevention Research Institute, Kyoto University)

## **Lectures at Oubaku Plaza in Uji Campus, Kyoto University**

L0 Guidance and outline of the 19 <sup>th</sup> IHP Course Water resources and water related disasters under climate change	T. Kojiri
L1 Climate change projection, impact assessment and adaptation	E. Nakakita
L2 Assessment of climate change impact on surface energy and water balance	K. Tanaka
L3 Frequency analysis of hydrological extreme events and how to consider climate change	K. Takara
L4 Flood prediction using run-off models under climate change	Y. Tachikawa
L5 Flow and sediment regime changes and adaptation by reservoir operation	T. Sumi
L6 Numerical analysis of groundwater model under climate change	T. Hamaguchi
L7 Basin-scale water quality analysis and water environment evaluation under climate change	Y. Kido
L8 Water resource management in arid region under climate change	O. Kozan
L9 Impact assessment on lake basin environment under the SRES climate change scenarios using Biwa-3D integrated assessment model	Y. Yamashiki
L10 Habitat structure assessment for stream ecosystem impacts under climate change	Y. Takemon
L11 Prediction and adaptation measures for water related disasters in urban areas	K. Toda
L12 Methods for high wave prediction under climate change	H. Mase
L13 Modeling of the Interaction between Water Resources and Socio-economic Systems	T. Hori
L14 Adaptation of water resources management for climate change	T. Kojiri

## **Experiments at Ujigawa Open Laboratory (technical visits)**

E1 Evaluation of influence on sediment runoff system in watersheds	M. Fujita
E2 Sediment disasters caused by natural dam failure Experiments on natural dam failure	H. Nakagawa
E3 Tsunami propagation and deformation in channels (Experiment)	T. Yasuda

## **Practices**

P1 Bias detection and correction of GCM output for climate change impact assessment study	K. Tanaka
P2 Practice for impact assessment by a distributed hydrological model using GCM data	Y. Sato
P3 Prediction model of random wave transformation – program usage-	N. Mori

## Schedule (29 November to 12 December 2009)

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- 29 (Sunday) Arrival at Osaka Kansai Airport
- 30 (Monday) Guidance at Oubaku Plaza in Uji Campus of Kyoto University  
Lecture 0 by T. Kojiri  
Reception in Kyoto
- 1 (Tuesday) 9:30-12:00 Lecture 1 by E. Nakakita  
14:00-16:30 Lecture 2 by K. Tanaka
- 2 (Wednesday) 9:30-12:00 Lecture 3 by K. Takara  
14:00-16:30 Lecture 4 by Y. Tachikawa
- 3 (Thursday) 9:30-12:00 Lecture 5 by T. Sumi  
14:00-16:30 Lecture 6 by T. Hamaguchi
- 4 (Friday) 9:30-12:00 Lecture 7 by Y. Kido  
14:00-16:30 Lecture 8 by O. Kozan
- 5 (Saturday) Excursion in Lake Biwa, Seta, Uji and Yodo River
- 6 (Sunday) Japanese culture introduction and free time
- 7 (Monday) 9:30-12:00 Lecture 9 by Y. Yamashiki  
14:00-16:30 Lecture 10 by Y. Takemon
- 8 (Tuesday) Technical Tour at Ujigawa Open Laboratory  
9:30-16:30 Lecture 11 by K. Toda  
Lecture and Experiment 1 by M. Fujita  
Lecture and Experiment 2 by H. Nakagawa  
Lecture and Experiment 3 by T. Yasuda
- 9 (Wednesday) Practices at Uji Campus of Kyoto Univ  
9:30-16:30 Lecture 12 by H. Mase  
Lecture and Practice 1 by K. Tanaka  
Lecture and Practice 2 by Y. Sato  
Lecture and Practice 3 by N. Mori
- 10 (Thursday) 9:30-12:00 Lecture 13 by T. Hori  
14:00-16:30 Lecture 14 by T. Kojiri
- 11 (Friday) 9:30-12:00 Report  
13:00-15:00 Closing Ceremony  
15:00- Free Time
- 12 (Saturday) Departure from Osaka
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\* Lectures and practices are held at Seminar Room 4 of Oubaku 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>

\* Experiments and Lectures on 8 December are held at Ujigawa Open Laboratory of Kyoto University. Refer the following site for access and map of Ujigawa Open Laboratory.

[http://www.dpri.kyoto-u.ac.jp/openlab\\_e/](http://www.dpri.kyoto-u.ac.jp/openlab_e/)