Global Center of Excellence for
Water Hazard and Risk Management

ICHARM

International Centre for Water Hazard and Risk Management
under the auspices of UNESCO

NEWSLETTER

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New Version of IFAS (Integrated Flood Analysis System, Version1.2) is now available.

More details ▶ Page 6, 7

IFAS http://www.icharm.pwri.go.jp/research/ifas/index.html

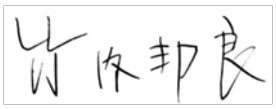
Message from Director

In these few months, a number of devastating disasters have been occurring once again in Asia and the Pacific region. Typhoon 0908 Morakot hit Taiwan on 8 August, which brought more than a 2800 mm rainfall in some places causing serious debris flows killing more than 600 people. A month later, Typhoon 0916 Ketsana (called Ondoy in the Philippines) brought heavy torrential rain in Luzon, including 410.6 mm in 9 hours in Manila, on 26 September killing more than 300 people. It was followed by Typhoon 0917 Parma (Pepeng), which stayed on 3-9 October near northern Luzon and caused serious landslides in the area killing also more than 300 people. Samoa Tsunami on 29 September killed about 200 people, and a day later on 30 September, an earthquake hit Padang, Sumatra, and killed more than 1100 people. ICHARM expresses the deepest sorrow to the people who lost their lives or deeply affected and sends a sincere condolence. ICHARM once again confirms our vital role in reducing such disasters in the world.

On 23-24 August, together with colleagues of ICHARM and the Nepal Development Research Institute (NDRI), I visited the Koshi River Basin, Nepal, to see a dike site which breached a year ago on 18 August 2008. We found the people affected by the flood and sediment still suffering from damages and struggling for recovery. The breached site was closed and new spurs were built, but the sand deposit is left unremoved and no farming has been resumed. Most of the local people are still dependent on various help programs of the government, which have been rather generous but now about to be terminated. They have to look for new life, but have not yet been able to find it so far. We met a group of more than a dozen local women and children who passed by the debris site. They had on their shoulders a bundle of bushes collected nearby to burn for their domestic use. They expressed their anxiety to the future. We could only encourage them stressing that the sure way to lead sustainable well-being is human empowerment by capacity development. We encouraged their children to continue schooling. They replied that, in spite of their hardship in daily life, they are making as much effort as possible in doing so.

In this context, ICHARM is pleased to have seven new masters successfully graduated from ICHARM master's course on water-related disaster management on 16 September. They all went back home and resumed their duties with a higher level of knowledge and experience in disaster management. In addition, they now have a good network of fellow experts with whom to exchange and discuss professional experiences. Two weeks later from their graduation, we welcomed thirteen new students at ICHARM for the 2009-2010 class and the master's program has started its third year.

Kuniyoshi Takeuchi
Director of ICHARM



Master's Course Update

Master's Program "Water-related Risk Management Course of Disaster Management Policy Program" completes its successful second year and starts its third year

ICHARM has been conducting a one-year Master's program entitled the "Water-related Risk Management Course of Disaster Management Policy Program" since September 2008 in collaboration with the Japan International Cooperation Agency (JICA) and the National Graduate Institute for Policy Studies (GRIPS).

The second class of graduates from the Master's program gathers for photos at the front gate of the GRIPS (16 Sep.)

This training course is characterized by the following three points: "Problem Solving-oriented", "Practical Rather Than Theoretical" and "One-year Master's Course".

In the second year, out of nine who initially started this program, seven students (two each from Bangladesh and China, one each from Ethiopia, Nepal and Indonesia) finally fulfilled the graduating requirements and were granted a Master's degree in disaster management. Mr. Biswas Robin Kumar was awarded the "Outstanding Award" by Director Takeuchi for his distinguished achievement.


Mr. Biswas is awarded the Outstanding Award by Director Takeuchi.

The program provided a great opportunity for the students to increase their professional knowledge by working on their theses. Additionally, it greatly helped ICHARM itself to create and strengthen a global network through them. The network of this kind will surely contribute to future ICHARM activities to a great extent.

This year, the program added another unique feature to itself to motivate students to work even harder on graduation theses. They were strongly encouraged to submit theses to professional societies in Japan. As a result, two students were given an opportunity to present their papers at the Japan Society of Hydrology and Water Resources in August and at the 11th International Summer Symposium in September hosted by the Japan Society of Civil Engineers. The training program will continue to provide prospective students with presentation opportunities such as these and further motivate them to work towards better Master's theses.

Shortly after the second graduation, the program started its third year on 6 October. The opening ceremony was held at ICHARM on 8 October. Thirteen students participate in the program from Bangladesh (2), China (1), Ethiopia (1), Indonesia (3), Japan (1), Myanmar (1), Philippines (1), Sri Lanka (2) and Thailand (1). On behalf of the students, Mr. Fano Jerry Austria from the Philippines spoke in front of the ceremony participants and expressed his strong determination to complete the one-year program successfully.


Mr. Fano makes a greeting address.

This program is also a contribution to the United Nations (UN) Decade for Education and Sustainable Development (DESD) 2005-2014.

For more details, please visit: http://www.icharm.pwri.go.jp/html/training/index.html


Group photo at the opening ceremony of master's program (8 Oct.)

Information Network

Em. Prof Roland K. Price of UNESCO-IHE visits ICHARM for Training Review (21-27 July 2009)

Em. Prof Roland K. Price of UNESCO-IHE visited ICHARM from 21 to 28 September, to review the Master's course and research activities currently conducted by ICHARM. He was invited for this review in response to the request from Kuniyoshi Takeuchi, director of ICHARM.

In the review, he gave us various kinds of advice about the Master's course and research activities. ICHARM will continue to brush them up based on his advice to make global contribution in water-related disasters and risk management.

◀ Training review (the second person from the left is Prof. Price.)

The Letter of Agreement "*Partnership among ADB, PWRI and ICIMOD for the Preparation of Asian Water Development Outlook 2010 (AWDO2010) - Key Dimension 5: Building Resilient Communities*" signed (30 September 2009)

As also reported in the July 2009 edition of ICHARM Newsletter No.13, ICHARM participated in drafting the second Asian Water Development Outlook (AWDO2010) to write Key Dimension 5 (KD 5): Building resilient communities that can adapt to changes, focusing on disaster risk management and preparedness, among other four key dimensions outlined in the table below.


AWDO team meeting at PUB, Singapore

The Asian Development Bank (ADB) has commissioned the second edition of AWDO, which will be published in 2010. A team of experts from the regional water knowledge hubs and lead organizations of the Asia-Pacific Water Forum (APWF) have been designated to prepare AWDO 2010. Yoganath Adikari, research specialist, and Yoshiyuki Imamura, chief researcher, are in the expert list of the AWDO team from ICHARM. Adikari attended the 4th AWDO team meeting from 17 to 18 September, at the Public Utility Board (PUB) in Singapore to discuss the production and progress of the publication.

A tripartite letter of agreement on partnership for the preparation of Asian Water Development Outlook 2010 – Key Dimension 5: Building Resilient Communities was signed on 30 September by Dr. Tadahiko Sakamoto, chief executive of PWRI (ICHARM), Dr. Andreas Schild, director general of ICIMOD and Mr. Xianbin Yao, director general of the ADB Regional Sustainable Development to formalize the commencement of the tripartite partnership.

The following table shows the key dimensions of water security, those will be included in AWDO 2010 and respective lead organizations responsible for the production tasks.

Key Dimention of Water Security	Lead Organizations in the AWDO 2010 Team
1. Satisfying household needs	United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) + partners
2. Supporting productive economies	International Water Management Institute (IWMI), Food and Agriculture Organization of the United Nations (FAO) + partners
3. Managing vibrant and livable cities	Public Utilities Board (PUB) in Singapore + partners
4. Restoring healthy rivers	International Water Center (IWC) + partners
5. Building resilient communities	ICHARM, International Centre for Integrated Mountain Development (ICIMOD) + partners

Cross-cutting Priority for Water Security	Lead Organizations in the AWDO 2010 Team
Improving governance	Lee Kuan Yew School of Public Policy, National University of Singapore (LKYSPP) + partners

Information Network

Second Meeting Regarding Quadrilateral Exploration of Risk-Based Approaches/ Standards, Tsukuba, Japan (30 September-1 October 2009)

Participants of the quadrilateral meeting.

Flood management officials from the Netherlands, United Kingdom, USA and Japan attended this meeting. From ICHARM, Kuniyoshi Takeuchi, director, Shigenobu Tanaka, deputy director, and four senior members joined this meeting as specialists on flood risk assessment and management.

On the first day, the participants took a field trip to see typical flood control projects in Japan. Principal issues were discussed on the second day at the National Institute for Land and Infrastructure Management (NILIM) in Tsukuba. The participants intensively exchange and share information on 1) methodology to qualitatively evaluate comprehensive flood risk and 2) best practices to manage flood risk based on a variety of risks and river basin characteristics.

Two presentations were made by Japanese representatives. Kazuhiko Fukami, leader of the Hydrologic Engineering Research Team of ICHARM, introduced current practices of flood risk assessment. Mr. Koji Ikeuchi, director of the River Planning Division of the River Bureau, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), presented typical practices of flood risk management in both highly urbanized and rural areas. The meeting agreed that further discussion should be promoted and the final outputs of the joint research on best practices of risk-based approaches were to be presented at the 5th International Conference on Flood Management (ICFM5), which will be held in Tsukuba, Japan, in autumn of 2011.

ICHARM Signs the MOU with IRTCES (17 September)

ICHARM signed the Memorandum of Understanding (MOU) with the International Research and Training Center on Erosion and Sedimentation (IRTCES.) The signing ceremony was held at ICHARM on 17 September. Six people participated including Prof. Hu Chunhong, secretary-general of IRTCES, and Kuniyoshi Takeuchi, director of ICHARM, Shigenobu Tanaka, deputy director of ICHARM, and three other people from ICHARM. Prof. Hu and Director Takeuchi signed the agreement.

MOU is expected to enhance cooperation between the institutes in the field of water disaster risk management.

Prof. Takeuchi (left) and Prof. Hu (right) ▶

<ICHARM's research partners>

Organization	Country	Date
International Research and Training Center on Erosion and Sedimentation (IRTCES)	China	17 September 2009
University of Yamanashi	Japan	27 March 2009
Flood Control and Sabo Engineering Center (FCSEC)	Philippines	21 July 2008
UNESCO-IHE Institute for Water Education (UNESCO-IHE)	Netherlands	9 June 2008
Regional Centre on Urban Water Management (RCUWM-TEHRAN)	Iran	9 June 2008
Bureau of Reclamation of the Department of the Interior of the United States of America	USA	20 June 2007
Special Corporation Korea Disaster Prevention Association (KDPA)	Korea	25 December 2006
United Nations University	International Organization	22 August 2006
Institute for Water Resources (IWR)	USA	3 July 2006
Royal Irrigation Department of Thailand	Thailand	16 December 2005
Regents of the University of California, on behalf of the Davis Campus	USA	23 August 2005
Korea Institute of Water and Environment (KWATER)	Korea	10 November 2003
Mekong River Commission, National Institute for Rural Engineering	Cambodia	21 March 2003
China Institute of Water Resources and Hydropower Research	China	17 February 2003
Korea Institute of Construction Technology (KICT)	Korea	12 November 2002

Sentinel-Asia Flood WG, Bali, Indonesia (15-17 July 2009)

Kazuhiko Fukami, team leader of the Hydrologic Engineering Research Team of ICHARM, attended the Joint Project Team Meeting (JPTM2009) of the Asia-Pacific Regional Space Agency Forum (APRSAF) held in Bali, Indonesia, during 15-17 July 2009. He is the chair of the Flood Monitoring Working Group of the Sentinel Asia Project, which aims to share disaster information in the Asia-Pacific region on the Digital Asia (Web-GIS) platform and to make the best use of earth observation satellites data for disaster management in the Asia-Pacific region. The Flood Monitoring WG discussed its Phase-2 activities, in particular, enhancement of sharing and utilizing flood alert information even in poorly-gauged rivers in developing countries through the promotion of the implementation of the Integrated Flood Analysis System (IFAS), jointly developed by ICHARM and private companies. IFAS can directly use quasi-real-time satellite-based rainfall products such as IFNet-GFAS and JAXA-GSMaP. The WG agreed to conduct training seminars for IFAS applications and start the selection of their venues.

IFAS Training Workshop in Nepal (26-27 August 2009)

An IFAS training workshop was held in Kathmandu, Nepal, from 26 to 27 August. This workshop was coorganized by ICHARM and the Nepal Research Development Institute (NDRI). Eight people gathered from universities, research institutes, river and disaster management agencies to learn how to operate the system. The participants voiced high expectations and a number of requests and comments related to IFAS.

ICHARM Researcher Kawakami (center) shows how to operate IFAS to Nepalese participants. ▶

Orientation Visit for Coastal Vegetation Survey in Yogyakarta and UNISDR-ESCAP Meeting in Bangkok (Yogyakarta: 10-14 September 2009/ Bangkok: 15-18 September 2009)

Under the frame of research on sustainable tsunami countermeasures for developing countries, ICHARM dispatched Research Specialist Dinar Istiyanto to Yogyakarta, Indonesia, from 11 to 14 September 2009, and to Thailand, Bangkok, from 15 to 18 September, 2009.

In line with the development of the Guideline for Planning and Design of Tsunami Mitigative Coastal Forests, ICHARM is collecting additional data on the characteristics of coastal vegetation in the southern coast of Java Island. The data collection will be conducted in cooperation with local partners. The mission to Yogyakarta was planned to discuss with potential local partners and visit potential locations for field survey. Istiyanto visited the Research Center for Disaster (PSBA) of Gadjah Mada University at Yogyakarta to discuss cooperation in the coastal vegetation data collection and analysis. He also visited the Regional Planning Board of Yogyakarta Province and collected information about the Proposal of Coastal Forest Creation Sites and Basic Policy. After that, he also visited three potential locations for field survey, i.e. Bugel and Ketawang Coasts at Central Java and Pacitan Coast at East Java. Further potential locations will be pre-surveyed by PSBA before survey locations will be finally determined.

Interviewing a local resident during the pre-survey at Pacitan, southern coast of Java.

Istiyanto also visited Bangkok, Thailand, to participate in the End-of-Project and Impact Review Meeting of the "Building Resilience to Tsunami in Indian Ocean Region" project, coordinated by UNISDR and funded by the EC and then the UNISDR-ESCAP Joint Regional Consultation Meeting focusing on "Coastal and Climate Hazard: Priorities for the Indian Ocean and South East Asia". In the first meeting, he presented the positive impacts of the Comprehensive Tsunami Disaster Prevention Training Course, which was conducted by ICHARM about a year ago, based on the questionnaire answered by the former training participants in India, Indonesia, the Maldives and Sri Lanka. In the second meeting, the participants agreed on the priority areas for prospective joint work related to coastal and climate hazards. They were classified into preparedness of coastal communities for disaster and climate change, education and awareness on disaster and climate change, communication of disaster and climate information, and disaster and climate risk knowledge.

All participants after the UNISDR-ESCAP Meeting in Bangkok.

International Workshop on Application and Validation of GFAS/IFAS

The Hydrologic Engineering Research Team of ICHARM has developed a concise flood-runoff analysis system called "Integrated Flood Analysis System (IFAS)" as a toolkit for more effective and efficient flood forecasting in developing countries. IFAS is equipped with interfaces to input both ground-based and satellite-based rainfall data, GIS functions to construct flood-runoff models, a default runoff analysis model, as well as interfaces to display output results. All these contribute to efficient installation of flood forecasting systems in poorly gauged basins. Moreover, to assist engineers in developing countries in independently forecasting floods, we are not only developing an analysis system but also distributing IFAS free of charge and holding trainings and workshops. Meanwhile, the 15th World Meteorological Organization (WMO) Commission for Hydrology (CHy) last November adopted the resolution that includes WMO's support for the dissemination of this system.

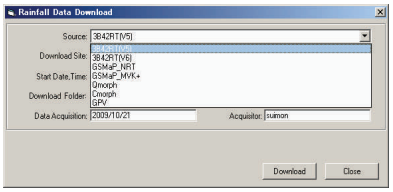
Discussion with workshop participants

As a part of ICHARM activities to reduce flood hazards, we held the International Workshop on Application and Validation of GFAS/IFAS jointly with the International Flood Network (IF-Net, founded to promote international cooperation in flood countermeasures) on 3 to 7 August, funded by the Asia-Pacific Network (APN) for Global Change Research. We invited six participants currently involved in flood prediction or disaster management from six nations such as India, Indonesia, Nepal, Bangladesh, Vietnam, and Laos.

The workshop provided the participants with a variety of learning opportunities to contribute to their efforts in flood damage reduction at home. They reported current situations related to flood management in their countries. They visited the Edogawa River Office to learn flood prediction presently in practice in Japan. The Japan Aerospace Exploration Agency (JAXA) gave them a presentation on a satellite-based rainfall observation project. ICHARM Hydrologic Engineering Research Team also gave a presentation on IFAS, including the development background, main functions and the operation method. The participants installed a new version of IFAS, released in this opportunity, in their computers, learned to operate run-off analysis using satellite-based rainfall, and produced run-off models of target basins in their own country.

New Version of IFAS (Version 1.2)

The latest version of Integrated Flood Analysis System (IFAS) is now available at the ICHARM website (http://www.icharm.pwri.go.jp/research/ifas/index.html) for free download. In addition to an installer, users can download the IFAS manual and sample data. The following are some of the main improvements added to the previous version:

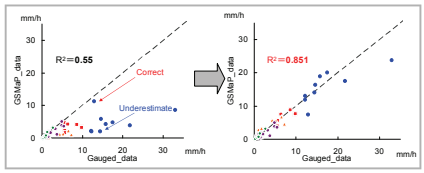


1. More satellite-based rainfall products

Two more satellite-based rainfall products, GSMaP_NRT*1 and 3B42RT_V6*2 were added as input rainfall data.

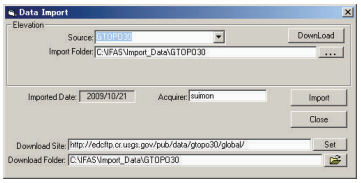
*1: Available at http://sharaku.eorc.jaxa.jp/GSMaP/index_j.htm

*2: Available at ftp://trmmopen.gsfc.nasa.gov/pub/merged/mergeIRMicro



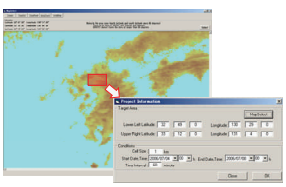
2. Correction function for satellite-based rainfall

The correction function for GSMaP was added.



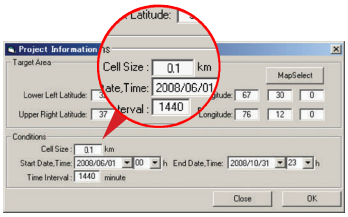
3. Additional GIS data

GIS data for the global map (http://www1.gsi.go.jp/geowww/globalmap-gsi/globalmap-gsi.html) was added as additional data for model creation.



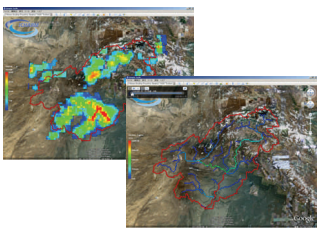
4. Improved function for target-area selection

This improved function enables users to select target areas easily on a map.



5. Improved model resolution

With the new IFAS, users can set the model resolution for runoff analysis in 0.1 km.



6. Improved output function

The new IFAS can display calculation results on Google Earth in KML and KMZ in addition to previous file formats.

Research

Introduction of "IFAS " (No.2)
PWRI-Distributed Hydrological Model (Version 2.0)

The Hydrologic Engineering Research Team of ICHARM is currently working on development of the Integrated Flood Analysis System (IFAS), a flood forecasting system capable of using satellite-based rainfall information. ICHARM Newsletter has been covering the main functions of IFAS as a series. Satellite-based rainfall and its correction method were introduced in the previous issue. In this brief report, we will explain further progress in the IFAS project with specific focus on the PWRI Distributed Hydrological Model, one of the IFAS main engines.

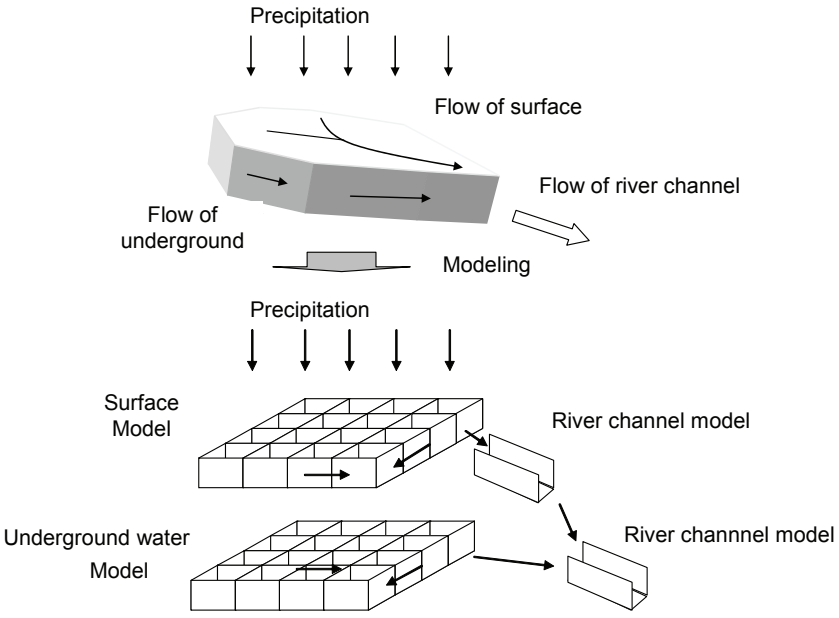


Figure-1 an outline of PWRI Distributed Model

IFAS uses two runoff analysis models. One is the PWRI Distributed Hydrological Model, developed by the Public Works Research Institute (PWRI), and the other is the BTOP model, mainly developed by University of Yamanashi. IFAS is designed to deal with different types of flood events such as typhoons and seasonal floods by means of different models for different purposes.

The features of the PWRI Distributed Model is as follows:[1)]

(1)A basin is divided into fine meshes. Discharge is calculated for each mesh (Figure-1).

(2)Each mesh has two tanks in the vertical direction, surface and aquifer tanks (Figure-2). Water gathered in a surface tank flow out in the vertical and horizontal directions (to adjacent cells in both directions). For tracking river channels, IFAS uses the Kinematic Wave Model to calculate the time delay.

(3)The PWRI model simply estimate parameters by using mesh information such as landform, soil, geology, and land use as constants. (IFAS has the function of loading elevation, land use and other data and can automatically make drainage courses and set parameters.)

The PWRI Distributed Model is a constant distributed runoff model which estimate discharge for each mesh. This feature enables IFAS to display calculation results at any given point. We can make easy use of this model because of the installed tools of GIS, user-friendly interfaces, and a correction method for satellite-based rainfall data (For details, see ICHARM Newsletter No.13).

Our next step is to disseminate and apply IFAS worldwide based on local situations and users' needs. We simultaneously aim at further improvement of its functions such as calibration of parameters and validation of simulation results.

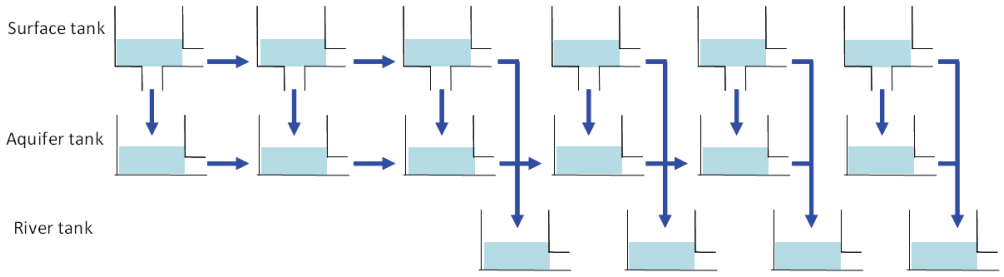


Figure-2 sketch of water flow

1)Integrated Flood Analysis System (IFAS Version 1.2) User's manual: Kazuhiko Fukami, Tomonobu Sugiura, Jun Magome, Takahiro Kawakami, Technical Note of PWRI No.4148, 2009

Coming Events

◆ICHARM Quick Report on Floods 10 December 2009, ICHARM, Japan

ICHARM organizes a collection of quick reports on the most serious floods occurring 2008-2009, inviting top local experts responsible for national flood research and management. Experts from Taiwan, the Philippines, Myanmar and Bangladesh are also scheduled to attend the meeting.

Date: Thu. 10 December 2009

Venue: ICHARM Auditorium (Tsukuba-city, Japan)

More details will be uploaded on ICHARM website (http://www.icharm.pwri.go.jp/index.html.)

◆5th meeting of International Coordination Group (ICG), GEOSS Asia Water Cycle Initiative (AWCI)

15–17 December 2009, the University of Tokyo, Japan

In order to promote the Asian Water Cycle Initiative (AWCI) contributing to the Global Earth Observation System of Systems (GEOSS), current status and future directions of its demonstration projects in Asia such as researches and capacity buildings for integrated water resources management (IWRM) will be discussed.

New Members Joined ICHARM

Yoshiyuki Imamura (Chief Researcher for Special Assignment)

Dr. Yoshiyuki Imamura joined ICHARM on 1 August as a chief researcher for special assignment. He is engaged in drafting the Asian Water Development Outlook (AWDO2010): KD5 and a wide array of assignments for the International Flood Initiative (IFI).

He studied at the University of Cambridge from 1995 to 1997 and received the Student Prize in a competition held by the East Anglian Branch of the Chartered Institution of Water and Environmental Management (CIWEM). He worked at the Secretariat of the World Water Assessment Programme (WWAP) housed in UNESCO headquarters from its establishment in 2000. He was engaged in the production of the World Water Development Report (WWDR) and the launch of IFI. He was also responsible for establishing ICHARM at the Water Science Division of UNESCO until he returned to Japan in 2005. His recent research field is water policies in coping with the global water crisis.

Takahiro Sayama (Researcher)

Dr. Takahiro Sayama joined ICHARM as a researcher of the Hydrologic Engineering Research Team from 1 October. He will be working on the development of flood prediction systems based on distributed rainfall-runoff modeling. Before coming to ICHARM, he was an assistant professor at the Disaster Prevention Research Institute of Kyoto University and responsible for research and education related to rainfall-runoff and rainfall-sediment-runoff predictions. He was also a visiting scholar from August 2007 to August 2009 at Oregon State University, where he concentrated on research in forest hydrology particularly to answer a basic hydrologic question: "How does rain water move from mountains to streams?" Knowledge and field experience obtained from hydrologic process studies will be beneficial for his big challenge at ICHARM to develop a flood prediction system based on understanding local hydrologic processes.

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