

## Visit by Director-General of the Frontier Research Center for Global Change



From left, sitting: Tatsushi Tokioka, James Gaines, Klaus Keil, and Toshio Yamagata; standing: Tetsuro Isono, Vassilis Syrmos, Judith Rubano, Saichiro Yoshimura, Julian McCreary, Katsuhiko Masuda.

**Tatsushi Tokioka**, the Director-General of the Frontier Research Center for Global Change (FRCGC), Japan Agency for Marine-Earth Science and Technology (JAMSTEC), visited the IPRC on December 2, 2005, together with Program Director of the

Climate Variations Research Program **Toshio Yamagata**, Advisor **Saichiro Yoshimura**, Director of the Research Promotion Office **Katsuhiko Masuda**, and Chief Administrative Officer **Tetsuro Isono**.

A luncheon was given in honor of

the visitors at Hawai'i Hall, the oldest building of the University of Hawai'i (UH), where the group from FRCGC and JAMSTEC were welcomed by UH Interim Vice President for Research **James Gaines**, the chief research policy advisor to UH Interim President **David McClain**. Vice President Gaines expressed his appreciation to Director-General Tokioka for the valuable support given by JAMSTEC and FRCGC to the IPRC climate research.

At the IPRC, the visitors discussed funding for the IPRC with Interim Dean of SOEST **Klaus Keil**, Acting Director of Administration for SOEST **Judith Rubano**, and IPRC Director **Julian McCreary**. They also met with IPRC research team leaders, who gave summaries of their most recent research projects. [iprc](#)

## IPRC Scientific Advisory Committee Meeting



Scientific Advisory Committee members, from left, sitting: Julian McCreary, Kensuke Takeuchi (Co-chair), Antonio Busalacchi (Co-chair); standing: Atsushi Kubokawa, Gary Meyers, Roberto Mechoso, Gerald Meehl, Masahide Kimoto, Peter Cornillon, and Humio Mitsudera.

The IPRC Scientific Advisory Committee met in November 2005 to review research progress at the IPRC. The committee noted a rise in the quality, consistency, and collaboration of IPRC science activities; the progress in the APDRC; the reorganization of the annual report; and the IPRC's hosting of internationally recognized meetings. [iprc](#)

## IAMAS 2005 Presidential Lecture Given by IPRC's Kevin Hamilton



Kevin Hamilton gives IAMAS Presidential Lecture in Beijing, China.

IPRC's Kevin Hamilton gave the Presidential Lecture at the Plenary Opening Session of the Ninth Scientific Assembly of the International Association of Meteorology and Atmospheric Science (IAMAS), which was held August 2–11, 2005, in Beijing, China.

His lecture, “Ultrafine Resolution Global Atmospheric Modeling,” included discussion of the results on high-resolution atmospheric modeling obtained in a collaboration between the IPRC and Japanese colleagues at the Earth Simulator Center and at Hokkaido University (see *IPRC Climate*, Vol. 3, No. 2, “Atmospheric Modeling on the Earth Simulator”).  
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Participants of the Regional Climate Workshop in Beijing. Workshop Chair Yuqing Wang is the sixth from right in the back row.

## IPRC Service to the Climate Research Community

### Shang-Ping Xie Appointed as an Editor of *Journal of Climate*

Shang-Ping Xie, co-leader of the Indo-Pacific Climate Research Team has been appointed by the Council of the American Meteorological Society as an editor of the *Journal of Climate*. His editorship begins January 1, 2006, and is for a three-year term. With this appointment, Xie regrettably steps down from the editorship with the *Journal of the Meteorological Society of Japan*, a position in which he has served since 2000.

Impact indices show that the *Journal of Climate* has grown into one of the most influential journals in atmospheric and ocean sciences since its inception in 1988. A semi-monthly publication, the journal published in 2004 about 350 papers with a total 4,909 pages. [iprc](#)

### Yuqing Wang Chairs Regional Climate Modeling Workshop

The 4th Workshop on Regional Climate Modeling for the Monsoon System was held at the Beijing Climate Center (a regional climate center of the World Meteorological Center) of the

China Meteorological Administration in Beijing on August 12–13, 2005. IPRC's Yuqing Wang, who helped to organize the very first workshop at the IPRC in 2001 (*IPRC Climate*, Vol. 1, Fall), chaired this workshop. Wenjie Dong (National Climate Center, China Meteorological Administration), Fujio Kimura (University of Tsukuba), Takehiko Satomura (Kyoto University), and Wei-Chyung Wang (State University of New York at Albany) were on the organizing committee. The Beijing Climate Center sponsored the workshop.

Presentations ranged from regional coupled ocean–atmosphere model development and regional climate process studies, to operational seasonal climate prediction. Encouraging was the report that the China National Climate Center's use of a regional climate model improved seasonal climate prediction over a coupled general circulation model. Progress is seen also in such modeling issues as the time-lagged effects of spring Tibetan Plateau soil moisture on the early summer East-Asian monsoon; the effects of runoff and spin-up time on regional climate-



model performance; the sensitivity of East-Asian summer monsoon rainfall simulations to convective parameterization schemes; and the behavior of cloud processes and the water and energy cycles in regional climate simulations.

Discussed at length were issues in simulating the diurnal cycle of tropical precipitation: the diurnal cycle of clouds and precipitation will be a focus of the Regional Atmospheric Inter-Model Evaluation (RAIME) Project (of which Yuqing Wang is the coordinator). Discussed were also the effects of domain size, lateral boundary conditions, driving fields, and deep soil temperature anomalies on regional model performance.

Studies in the planning are as follows: climate processes—land surface processes in the diurnal cycle and monsoon evolution, the hydrological cycle in the monsoon system, and the effect of air-sea interaction on summer precipitation and East-Asian monsoon onset; simulation and prediction—extending simulations to include the winter monsoon, intraseasonal oscillations, subseasonal and interannual variability, and extreme climate events; and projections of global warming scenarios of extreme climate events. The 5th Regional Modeling Workshop will be held at the IPRC in Spring 2007. [iprc](#)

## IPRC-Sponsored Student from Japan Receives Ph.D.

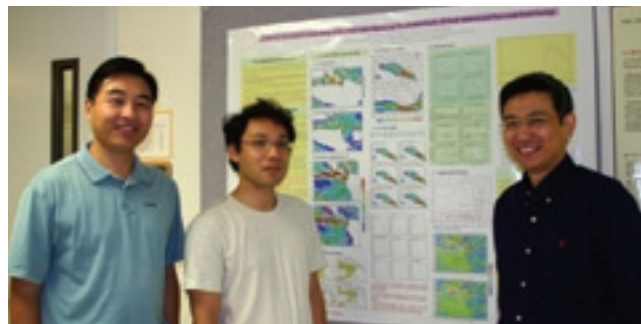


Yuko Okumura with her adviser, Shang-Ping Xie.

**Yuko Okumura** received her Ph.D. in meteorology from the University of Hawai'i at Mānoa in December 2005. After completing her master's degree in ocean and atmospheric sciences at Hokkaido University, Okumura came to the University of Hawai'i in 2000 to continue her

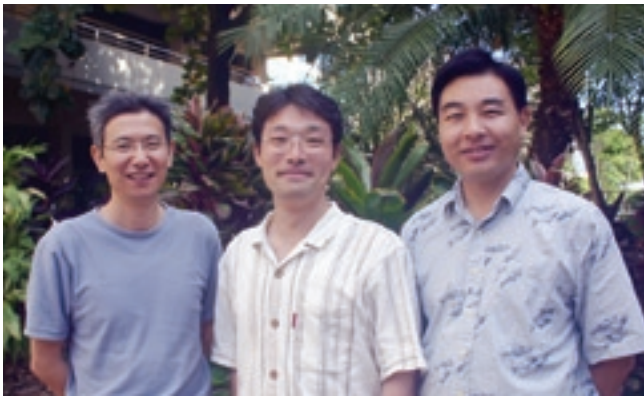
graduate education with **Shang-Ping Xie**, co-leader of the Indo-Pacific Ocean Research Team, as her adviser. In her doctoral research on the seasonal and interannual variations in tropical Atlantic climate, she found a previously unknown mode of equatorial variability for that region—a variability that is similar in spatial structure to the El Niño-Southern Oscillation in the Pacific. She was sponsored by the IPRC and a NOAA research grant to the University of Hawai'i. [iprc](#)

## Collaborations



Yuqing Wang, Minoru Chikira, and Shang-Ping Xie in front of the poster depicting the IPRC Regional Climate Model simulation of the stratocumulus cloud deck in the tropical eastern Pacific.

**Minoru Chikira**, a postdoctoral researcher at the Frontier Research Center for Global Change, JAMSTEC, is visiting the IPRC from October 2005 through March 2006 to work with IPRC's **Yuqing Wang** and **Shang-Ping Xie**. The scientists are engaged in improving the representation of the marine stratus and stratocumulus clouds over the southeastern Pacific in the Frontier general circulation model. Realistic simulation of these clouds should reduce the common biases that coupled air-sea general circulation models have in the tropical eastern Pacific. Chikira is developing a single column model that incorporates the model physics from both the Frontier model and the IPRC Regional Climate Model. The latter model simulates the stratus and stratocumulus clouds in the region reasonably well, especially the boundary layer and the cloud-regime transitions from the coastal stratus to the offshore stratocumulus clouds, to the trade cumuli farther to the west. The column model will be used to identify the processes that are critical for the realistic simulation of marine stratus and stratocumulus clouds. The knowledge gained will then be applied to improving the simulation of these clouds in the Frontier model and their representation in fully coupled climate models.



Shang-Ping Xie (left) with Tomohiro Nakamura and Yuqing Wang.

**Tomohiro Nakamura**, oceanography lecturer, Institute of Low Temperature Science at Hokkaido University, Japan, visited IPRC in September 2005. During the visit, Nakamura worked with **Yuqing Wang** and **Shang-Ping Xie** to adapt the IPRC Regional Climate Model as the atmospheric component for the regional coupled model that is being developed at Hokkaido University for study of the Ohkotsk Sea.



Wataru Ohfuchi with Kevin Hamilton.

**Wataru Ohfuchi**, leader of the Atmospheric and Oceanic Simulation Research Group of the JAMSTEC Earth Simulator Center, visited IPRC in June. During his visit at the IPRC, he worked with **Kevin Hamilton** on analysis of results from the high-resolution, global Atmospheric Model for the Earth Simulator (AFES). Ohfuchi also gave a seminar, “Recent Results from the Coupled Ocean Atmosphere Model for the Earth Simulator (CFES).” [iprc](#)



Meteorology graduate students practice launching a weather balloon while IPRC’s Kevin Hamilton (left), Chair of the Meteorology Department, looks on.

## IPRC Participates in SOEST Open House



The School of Ocean and Earth Science and Technology held its biennial Open House October 14 and 15, 2005. IPRC researchers put on a great show. They entertained the public with an animation created at the IPRC from satellite rain data over the Island of O’ahu on the terrible day that the main library of the University of Hawai’i was flooded and sustained over 75 million dollars in damages. Using an animation created with the IPRC Regional Ocean Model, they showed how the ocean’s temperature around the Hawaiian Islands changes with the seasons. The audience was also fascinated by satellite-data animations of Hurricane Katrina’s path over the Gulf of Mexico and its landfall. [iprc](#)

# NEW IPRC STAFF

**Mototaka Nakamura** joined the IPRC this fall as a visiting associate researcher from Frontier Research Center for Global Change. Already in high school, Nakamura became aware of possible climate changes. “Back then,” he recalls, “we did see some really odd weather patterns. I became worried about the possibility of major climate changes



**Mototaka Nakamura**

associated with deep-circulation changes in the oceans.” His career path, though, took some side trips. He worked for a Japanese company before going to North Carolina State University to get his bachelor’s degree in 1989 in meteorology with a minor in oceanography. He spent the next years at MIT working on his doctoral degree and on “whatever interested me.” He explains: “I explored interactions among the atmospheric transports of moisture and heat, the thermohaline circulation, ice-albedo effects, and river runoff. I showed with conceptualized models the existence of complex stabilizing and destabilizing feedbacks among these processes and the masking of them by flux adjustments in coupled GCMs. Also, my work on non-linear behaviors of Rossby waves influenced by the larger-scale flow, particularly on shear and deformation fields, helped explain characteristics of material mixing in the upper troposphere and stratosphere and issues relating to the ozone hole problem.”

After completing his Ph.D. in 1994, Nakamura spent another year at MIT, joined the Georgia Institute of Technology for a year, worked at Goddard Space Flight, returned to MIT, and then joined the Jet Propulsion Laboratory for three years, where he examined the role of eddies (waves) in the large-scale circulation and material mixing and transport in the atmosphere and oceans.

He then left science and lived as a performing jazz musician for almost 2 years until a persistent pain in his left thumb forced him to return to science. He joined Duke University and then moved to Frontier Research Center for Global Change. At Frontier, he conducted research on both atmospheric and oceanic topics, which ranged from improvement of a convective mixing scheme developed by Kerry Emanuel to examination of eddy-mean relationships and their role in the large-scale ocean circulation.

At the IPRC, Nakamura will be investigating mechanisms of the alternating zonal jets with **Kelvin Richards** and **Nikolai Maximenko** and also conduct projects on the dynamics of the mid-latitude atmosphere and oceans.

**Yoshiki Fukutomi**, a research scientist with the Hydrological Cycle Research Program, Frontier Research Center for Global Change, Japan Agency for Marine-Earth Science and Technology (JAMSTEC), joined the IPRC in October 2005 as a Frontier visiting assistant researcher.



**Yoshiki Fukutomi**

Fukutomi obtained his Ph.D. in 2000 from the Institute of Geoscience, University of Tsukuba. In his dissertation on the early summer tropical-extratropical interaction associated with sub-monthly tropical convection in the western North Pacific monsoon region, he detected that tropical convection had an effect on mid-latitude atmospheric circulation, an effect involving subtropical Baiu frontal activity in the East Asia-Pacific region. After graduation, he worked at the University of Tsukuba’s Terrestrial Environment Research Center, where he constructed, from the NCEP-DOE AMIP-II reanalysis dataset, global atmospheric energy and water budget products for analyzing the continental-scale hydrological cycle. He also participated in the GAME 4-dimensional data assimilation reanalysis project conducted by the Meteorological Research Institute, Japan Meteorological Agency.

At Frontier since 2001, Fukutomi has been studying the causes of the year-to-year summer variations in the northern Eurasian hydrological cycle. He noted in the climate data over the last 30 years an east-west precipitation seesaw across Siberia at timescales of about 6–8 years. The seesaw reflects an east-west displacement of the storm track along the northern Eurasian Arctic frontal zone. Working with **Mototaka Nakamura**, he is now seeking the physical processes underlying this precipitation oscillation.

At the IPRC, Fukutomi is returning to his monsoon research and working with **Bin Wang** and the Asian-Australian Monsoon System Team. He had previously investigated characteristics of low-level southerly surges on sub-monthly timescales over the eastern Indian Ocean.

The surges are caused by the development of a mid-latitude Rossby wave that propagates in the subtropical jet region of the Southern Hemisphere and involves cold, dry air advection, air-sea interaction, tropical convection, and an equatorial wave response. He is now extending this work with 4-dimensional data assimilation and satellite observational data products and studying aspects of the cross-equatorial influence of this transient southerly surge on the south Asian monsoon region and on air-sea coupling processes.

**Yoshiyuki Kajikawa**, or “Kaji”, joined the IPRC in August 2005, after receiving his Ph.D. in meteorology from Nagoya University in Japan. Kaji tells how, when he was in junior high school and his baseball practice once was cancelled because of rain, his friend took him home and showed him how to draw a weather map of the event. He took



**Yoshiyuki Kajikawa**

up drawing weather maps from weather radio broadcasts as a hobby, spurring his interest in meteorology. While working as research assistant in the Hydrospheric Atmospheric Research Center at Nagoya University, Kaji was doing his doctoral research on the intraseasonal variations of the summer monsoon over the South China Sea. Analyzing these variations over many years, he noticed that during years that the northward propagating 30 to 60-day disturbances were strong, the westward propagating 10 to 25-day disturbances were weaker, and *vice versa*. This relationship seemed to be connected to the monsoon onset over the South China Sea.

Working at the IPRC with Team Leader **Bin Wang**, co-leader of the Asian-Australian Monsoon Research Team, Kaji is now exploring the mechanism that underlies the relationship between these two disturbances, focusing on the sudden changes in the summer monsoon seasonal cycle. In a second project, he is using output from a coupled general circulation model to clarify the effects of the high Tibetan Plateau on the intraseasonal variations of the Asian summer monsoon. This research is conducted in collaboration with scientists at Nagoya University and the Japan Meteorological Research Institute. His long-term goal is to show how interactions among land, air, and sea over the maritime continent affect global circulation.

**David Burns** joined the IPRC in Spring 2005 as computer systems engineer. He is working with Computer Systems Manager **Ronald Merrill**, helping IPRC staff solve their many and varied complex computer problems. He is also assisting with the maintenance and upgrading of computer hard- and software, a never-ending task.



**David Burns**

Burns likes to take stuff apart and put it back together. “Computer software is one of the few things that you can still use (one copy) at the same time you’re taking it apart (another copy). So I was drawn to computer programming as a career,” he recalls. After working for a decade in that field, he became interested in economics and got a Ph.D. in 1997 before discovering that taking the economy apart was really not a good idea. Returning to computers, he earned a master’s degree in Information and Computer Science at the University of Hawai’i in 2002. Now at the IPRC, Burns is interested in automating as many activities as possible so that the scientists can do their science and the IPRC Help Team can concentrate on adding capacity and capability.

## IPRC Bids Sayonara

**Soon-Il An**, who has been a researcher with the IPRC since its inception in 1997, returned to Korea this fall to take a position as an associate professor in the Department of Atmospheric Science at Yonsei University in Seoul. He is continuing his research on the long-term variations of the El Niño–Southern Oscillation (ENSO) and their predictability and how global warming may affect ENSO.

**Li Tao** ended her 18-month postdoctoral stay at the IPRC in December 2006. She has taken an associate professor position at the Department of Atmospheric Sciences, Nanjing Institute of Meteorology in China.

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