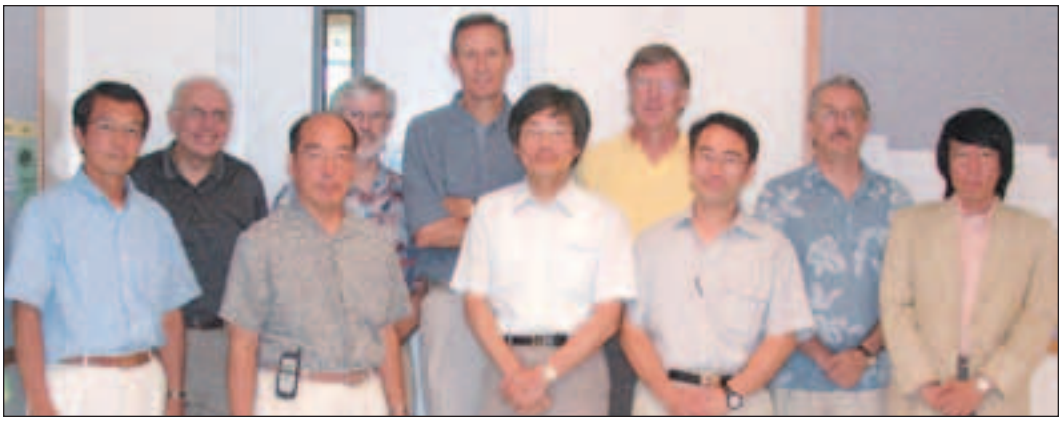
IPRC News

Toshio Yamagata Receives Sverdrup Gold Medal

Toshio Yamagata, Director of the Climate Variations Research Program at the Frontier Research System for Global Change and Frontier Program Director for IPRC, has been honored by the American Meteorology Society (AMS) "for his outstanding accomplishments in the study of ocean and climate dynamics, especially with respect to El Niño and air-sea interaction over the Indian Ocean." Yamagata received the AMS's 2004 Sverdrup Gold Medal at the Annual Awards Banquet held as a major event of the 84th Annual Meeting of the Society on Wednesday evening, January 14, 2004 in Seattle, Washington. Yamagata was also elected as a fellow of the AMS for his outstanding contributions to the atmospheric and related oceanic sciences.

Scientific Advisory Committee Meeting

October 23-25, 2003



From left to right, back row: *Roberto Mechoso (M), Julian McCreary, Jerry Meehl (M), Breck Owens (M), Antonio Busalacchi (Co-Chair);* ***front row:*** *Hitoshi Hotta, Saichiro Yoshimura, Akio Kitoh (M), Ichiro Asanuma, and Atsushi Kubokawa (M). (M identifies committee members.)*

Team Leader Changes at IPRC

Niklas Schneider, Associate Professor of Oceanography, has become co-leader of the Indo-Pacific Ocean Climate Research Team, freeing Director **Jay McCreary** to spend more time on the expanding IPRC. **Kelvin Richards**, Professor of Oceanography, has become co-leader of the Regional Ocean Influences Research Team, replacing **Humio Mitsudera**, who left in spring 2003 for a professorship at Hokkaido University. The IPRC is grateful to **Peter Hacker** for his work as the interim co-leader of this team.

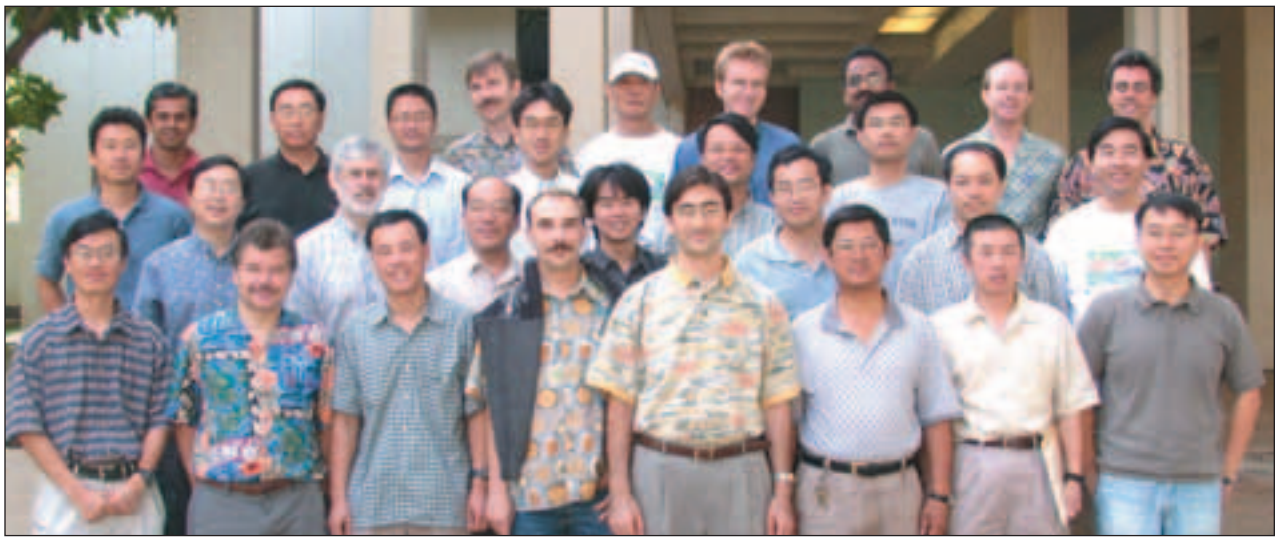
ICMA Elects President

Kevin Hamilton was reelected for a second four-year term as President of the International Commission for the Middle Atmosphere (ICMA), the organization in the IUGG structure that fosters international cooperation in the study of meteorology and atmospheric chemistry from the tropopause to the lower thermosphere. During Hamilton's second term, ICMA will have major roles in the scientific assemblies of the International Association of Geomagnetism and Aeronomy (2005, Toulouse, France) and the International Association of Meteorology and Atmospheric Sciences (2005, Beijing, China) and in the next IUGG General Assembly (2007, Perugia, Italy).

The Third IPRC Annual Symposium

The Third Annual IPRC Symposium was held May 22–23, 2003, in the Marine Science Building of the University of Hawai'i at Mānoa, Honolulu. During this annual event, the IPRC scientists presented their research highlights in a formal setting. It was a time to pause and reflect upon the research progress made by the institution as a whole and to identify areas for future research. This annual sharing is an opportunity to solicit comments and suggestions, and helps to reveal common research threads, which may prompt further collaboration among the scientists from the different IPRC research teams.

Niklas Schneider, co-leader of the Indo-Pacific Climate Research Team organized this third symposium. The topics of the 33 talks given at the symposium included studies of the Asian summer monsoon and prediction, Indian Ocean dynamics, Pacific Ocean variability and dynamics, its western-boundary currents, air-sea interactions that shape climate, climate sensitivity to large perturbations, and developments in the data-serving capabilities of the Asia-Pacific Data-Research Center. The agenda is posted at http://iprc.soest.hawaii.edu/meetings/workshops.html.



Little Islands, Big Wake

The article "Little Islands, Big Wake," which appeared recently on NASA's Earth Observatory (http://earthobservatory.nasa.gov/Study/Wake/), features the astounding effects of the Hawaiian Islands on the Pacific Ocean and atmosphere, an effect discovered by **Shang-Ping Xie**, IPRC co-leader of the Indo-Pacific Climate Team, and his colleagues. The team originally published their findings on the far-reaching effects of the small islands in the June 15, 2001, *Science* issue. The Earth Observatory article is based on an interview that **Laurie Schmidt** conducted with Xie and one of his co-authors, **Timothy Liu** from the Jet Propulsion Laborator. The article has also appeared in *Supporting Earth Observing Science 2003*, a publication of the NASA Distributed Active Archive Center Alliance.

IPRC Bids Sayonara

Weijun Zhu, postdoctoral fellow with the Impacts of Global Environmental Change Team, returned in August to China to become dean at the School of Graduate Study of Nanjing Institute of Meteorology (NIM), and associate professor in the Department of Atmospheric Sciences at NIM. He is teaching general atmospheric circulation to graduate and undergraduate students. His current research focuses on the influence of mid- to high-latitude general atmospheric circulation on the decadal variability of precipitation over East China.

Omer Sen, postdoctoral fellow with the Asian-Australian Monsoon System Team and implementer of the land-surface scheme into the IPRC Regional Climate Model, returned in August to his native Turkey, where he is awaiting a government position.

New IPRC Staff

Ryo Furue, who joined the IPRC in October 2003 as a postdoctoral fellow, came to oceanography in a roundabout way. Wanting to design car engines for a company such as Honda or Nissan, he entered the Department of Machine Engineering after completing his two years of general education at the University of Tokyo. But a course in fluid mechanics completely changed his future—he became fascinated with how a set of simple equations can account for infinitely varied phenomena.

Thus, after completing his courses in machine engineering in 1990, Furue switched fields and entered U. of Tokyo's School of Geophysics as a student of physical oceanography, which to him is a branch of fluid mechanics. Furue recalls: "People were puzzled about my switch; they just didn't see any connection between machines and the ocean. But to me the connection is clear—physics. People take up meteorology and oceanography because they are interested in such phenomena as hurricanes or ocean waves, and they study math and physics to understand those phenomena. For me it was the opposite: I got intrigued by fluid dynamics and its relationship to mathematics. I'm interested in physics not as a tool to understand phenomena, but in physics itself and how it is represented in oceanographic phenomena."

For his master's degree thesis, Furue applied the method of vertical modal expansion to the thermohaline circulation; for his Ph.D. thesis, he chose diapycnal mixing in the ocean, writing a 3-D spectral model for turbulence simulations. Three years before completing his Ph.D. in 1998, this youthful physicist, turned oceanographer, was appointed assistant professor at the Center for Climate System Research, U. of Tokyo.

The thermohaline circulation kept its charm and after finishing his dissertation, Furue studied the equatorial deep jets that appear in numerical solutions of purely thermal circulation. Recently he turned to researching the global circulation associated with North Atlantic Deep Water, in particular, the manner in which the global deep overturning circulation is affected by windstress over the Southern Ocean and by diapycnal diffusivity in the Indian and Pacific Oceans.

It still seems strange to Furue to call himself an oceanographer. "Oceanographers are people who go to sea to make measurements. I'm more of a 'computer oceanographer.'" At the IPRC, Furue will work with **Zuojun Yu** and the Indo-Pacific Ocean Climate Team. Using the U. of Tokyo's oceanic general circulation model, he will apply his expertise in numerical modeling and ocean dynamics to understand the equatorial subsurface currents, which are so important in ocean circulation.

Markus Stowasser joined the IPRC as a postdoctoral fellow in October 2003. Already as a child, he was fascinated by the weather and built a weather station in his backyard and did weather observations. So there was no question when he entered the University of Karlsruhe in Germany that he would study meteorology. After he received his "Diplom", the equivalent of a master's degree, in meteorology, he worked at the Forschungszentrum für Technik und Umwelt in Karlsruhe as a research assistant, while continuing his studies at the University of Karlsruhe, from where he received his Ph.D. in 2002. His dissertation research focused on stratospheric ozone depletion mechanisms for which he analyzed data from a balloon-borne Fourier Transform Infrared spectrometer that was specially tailored to operate on a stratospheric balloon gondola. This instrument allows precise limb emission sounding of chemical constituents related to the stratospheric ozone problem. Comparing the data to calculations with two 3-D Chemical Transport Models (CTMs) of the middle atmosphere, he found that state-of-the-art CTMs still have problems in simulating the diurnal cycle and the partitioning of several minor species of the nitrogen family. The accurate description of these species, however, is extremely important for the correct prediction of ozone-loss rates.

At the IPRC, Stowasser is working with **Kevin Hamilton**, leader of the Impacts of Global Environmental Change Team, on understanding why current coupled ocean-atmosphere climate models have such widely varying global climate sensitivities. He wants to understand why models differ and

what determines their sensitivity. He will also be looking at the geographical patterns of surface temperature sensitivity, and he will try to diagnose the role that ocean and atmospheric dynamics play in determining these patterns.

He plans to work also with **Yuqing Wang** on the effects of global warming on the intensity, number, and tracks of tropical cyclones. For this they will be applying the IPRC Regional Climate Model (*IPRC Climate*, Vol. 1, Fall; Vol. 2, no. 2).

Chi-Yung Francis Tam joined the IPRC as a postdoctoral fellow in November 2003, after completing the Ph.D. program in atmospheric and oceanic sciences at Princeton University. His dissertation is about the impact of the El Niño–Southern Oscillation (ENSO) on atmospheric intraseasonal variability and synoptic-scale disturbances. His results indicate that in the tropics, the extent of the eastward propagation of the Madden-Julian Oscillation (MJO) is greatly affected by ENSO. This is mainly due to the different SST conditions in the central-eastern Pacific during different phases of the ENSO cycle. In particular, further eastward penetration of the MJO-related convection anomalies is associated with warmer SST in the central-eastern Pacific and less penetration, with colder SST in the region. ENSO also influences the intraseasonal circulation in the North Pacific and North America. This latter influence is seen in both the amplitudes and patterns of typical circulation anomalies in the region. The influence on the circulation anomalies in the North Pacific and North America is partly due to changes in the extratropical mean state of the atmosphere during ENSO, and partly due to the impact of ENSO on the characteristics of the MJO-associated intraseasonal convective anomalies in the western Pacific.

At the IPRC, Tam is working with **Tim Li** and **Bin Wang**, co-leaders of the Asian-Australian Monsoon System Team. He plans to study the role of summertime, synoptic-scale activity on the formation of tropical cyclones by using high-resolution observational products such as data from the QuickSCAT satellite and products from the Navy Operational Global Atmospheric Prediction System (NOGAPS). The tropical cyclone research topic is related to the part of his dissertation about synoptic-scale disturbances in the tropics. "In my student days in Hong Kong," Tam recalls, "I was always excited by the phenomenon of tropical storms…because schools were closed when there was a typhoon approaching. I still find the phenomenon very exciting—of course for a rather different reason now."

Hiroshi Yoshinari joined the IPRC in late November 2003 as a postdoctoral fellow to work on a project funded by NOAA and the Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT). Yoshinari's fascination with physical oceanography came while he was a science major at the University of Ryukyus, Okinawa. "They had a great oceanography laboratory there," Yoshinari recalls. "The ocean is so much harder to research than the atmosphere where you can use radiosondes, airplanes, and satellites to take measurements; making measurements in the ocean is much harder." Accordingly, he sees *in situ* data as very important for oceanographic research and has been already on 7 ship cruises. One was in 1996, to obtain Mixed Water data in the Kuroshio-Oyashio region for his master's degree research on the formation, modification, and transport of North Pacific Intermediate Water. On his cruise in 1998, which took him to Hawaii, he collected data for his dissertation on the meridional transport of North Pacific Intermediate Water across 37°N. During these trips, he learned methods of collecting physical, chemical, and biological oceanographic data from ships and mooring systems and their analysis.

Upon obtaining his Ph.D. from Hokkaido University in 2001, Yoshinari worked at the Japan Science and Technology Corporation in Kawaguchi, Japan, on a project that studied the effects of winds on the interannual transport variations of the Kuroshio south of Japan. "For six months I tried to drive this OCGM (the GFDL-MOM2.2) without success; every day I checked and corrected the source code. Finally the goddess smiled on me, and the model ran smoothly, and some of the results are now in press." His next project was a study conducted by MEXT for which he was to collect all available hydrographic data for the Arctic oceans, a rather frustrating task: "I wrote so many emails—to Russia, to Scandinavia—but there is no data."

At the IPRC, Yoshinari is working in the Asia-Pacific Data-Research Center. Having developed in his previous research a way to use geostrophic velocity as a reference in statistically adjusting the velocity measured by Lowered Acoustic Doppler Current Profilers, he now aims to create a correction system for the velocity measurements made by Argo floats. The measurements of velocity taken by these floats as they sink and rise on their journey in the ocean's depths are quite noisy. Measures derived from satellite sea surface height data and wind data will serve as benchmarks for Yoshinari's calibration system.