

Asia-Pacific Network for Global Change Research



Annual Report 2006/2007

APN
Asia-Pacific Network for Global Change Research

Annual Report 2006/2007
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The APN Secretariat
5th Floor, IHD Centre Building
1-5-1 Wakinohama Kaigan Dori
Chuo-ku, Kobe 651-0073
JAPAN
Tel: (+81) 078-230-8017
Fax: (+81) 078-230-8018
Email: info@apn-gcr.org
Website: <http://www.apn-gcr.org>

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MESSAGE FROM THE DIRECTOR

It is my great pleasure to introduce to you the 2006/2007 Annual Report, which provides you with non-technical summaries of APN funded projects carried out in 2006/2007.

In 2006, based on our achievement of 10 years, the APN clearly left footprints on several occasions of current international importance: the 14th Session of the United Nations Commission on Sustainable Development (UNCSD) (May, New York, USA); the 24th session of Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC (May, Bonn, Germany); and the 3rd Plenary Session of the Group on Earth Observations (GEO) (December, Bonn, Germany). At these fora, we organised and/or participated in side events, etc. and successfully highlighted our global change research and capacity building activities in the context of the meetings.

Three years after its introduction, the CAPaBLE (Scientific Capacity Building and Enhancement for Sustainable Development in Developing Countries) Programme has now stepped into the second phase. Indeed, CAPaBLE has grown as another major pillar of the APN after the ARCP (Annual Regional Call for Research Proposals), and is certainly meeting the capacity building needs increasingly recognised in the global change community. In 2006/2007, we funded 15 ARCP projects and 13 CAPaBLE projects (including 3 new comprehensive research projects). I can also proudly introduce the publication of the APN's first book, *Global Change and Integrated Coastal Management: The Asia-Pacific Region* (edited by Nick Harvey and published by Springer) as a tangible fruit of our activities.

I would like to express my sincere appreciation to the governments, organisations and members of the APN, who contributed to the success of APN's activities scientifically, financially and institutionally. Without your support, the work of the APN in 2006/2007 would not have been possible. Furthermore, allow me to thank all global change research programmes and capacity development partners for their interest and collaborative efforts.



Hiroki Hashizume
Director, APN Secretariat

APN's Mission

The mission of the Asia-Pacific Network for Global Change Research (APN)¹ is to enable investigation of change in the Earth's life support systems as it occurs in the Asia-Pacific region to:

1. Identify, explain and predict changes in the context of both natural and anthropogenic forcing,
2. Assess potential regional and global vulnerability of natural and human systems, and
3. Contribute, from the science perspective, to the development of policy options for appropriate responses to global change that will also contribute to sustainable development.

APN's Goals

The APN has identified five goals that will be achieved through APN-funded activities. These activities are selected from the Annual Regional Call for Research Proposals (ARCP) process and the APN's capacity development programme, Scientific Capacity Building and Enhancement for Sustainable Development in Developing Countries (CAPaBLE).

- Goal 1. Supporting regional cooperation in global change research on issues particularly relevant to the region
- Goal 2. Strengthening appropriate interactions among scientists and policy-makers, and providing scientific input to policy decision-making and scientific knowledge to the public
- Goal 3. Improving the scientific and technical capabilities of nations in the region
- Goal 4. Cooperating with other global change networks and organisations
- Goal 5. Facilitating the development of research infrastructure and the transfer of know-how and technology

¹ The APN defines "global change research" as "research regarding global change (the set of natural and human-induced changes in the Earth's physical and biological systems that, when aggregated, are significant at a global scale) and its implications for sustainable development in the Asia-Pacific region."

Core Strategies

The core strategies of the APN are to:

1. Encourage and promote research that has the potential, in addition to improving understanding of global change and its implications in the region, to contribute to the establishment of a sound scientific basis for policy-making with regard to issues for which global change is an important factor.
2. Identify, in consultation with policy-makers and practitioners, the present and future needs for such research.

Vision

Changes in the Earth system are clearly impacting the societies and economies of the countries within the Asia-Pacific region. These countries support more than half of the world's population. Recent research and supporting observations have provided new insights into some of these changes and their impacts, but have at the same time opened a number of new and challenging scientific issues.

The APN seeks to identify such emerging issues and to promote and encourage regional cooperative research to address these. In doing so, the APN assures that the results of this research contribute to the development of a sound scientific basis for policy- and decision-making related to issues for which global change is an important factor.

The APN strives to enable the developing countries of the region to participate increasingly in, and to benefit fully from, cooperative research in the region. Finally, recognising the interactive role of regional processes in the overall Earth system, the APN also seeks to link the research it sponsors with research conducted in other regions and under the aegis of global-scale programmes.



APN FUNDED PROJECTS



ARCP

Highlights and publications for completed APN projects are included in this chapter of the Annual Report. Further details on any of the projects highlighted in this publication can be obtained by contacting the APN Secretariat at info@apn-gcr.org or visiting the APN website at <http://www.apn-gcr.org>.

ARCP2006-01CMY-Ohtani: Standardization and Systematization of Carbon Budget Observation in Asian Terrestrial Ecosystems Based on AsiaFlux Framework

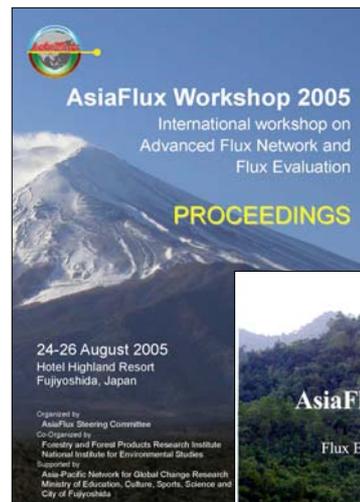
Project Leader: Mr. Yoshikazu Ohtani

Email: ohtan03@affrc.go.jp

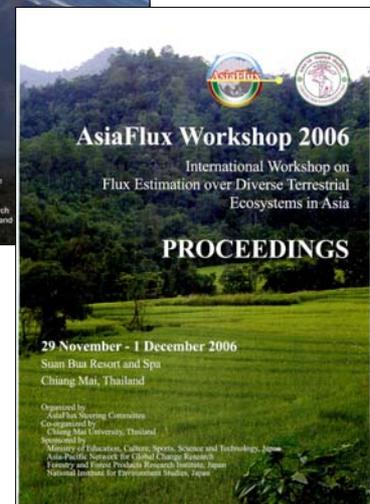
Funding: US\$ 45,000 for two years

Participating Countries: Australia, Bangladesh, India, Indonesia, Japan, Malaysia, Republic of Korea and Thailand

Summary: The estimation of carbon budget in terrestrial ecosystem is one of the urgent research subjects in climate change study and the implementation of the Kyoto Protocol. The micrometeorological approach has been the most common method in this study field; however, the technique has not yet been standardized nor fully diffused into Asian countries. This project aimed (1) to promote information exchange and to improve methodology in flux observation and data analysis among participating countries in order to provide much more reliable carbon budget data in Asian monsoon terrestrial ecosystems; and (2) to promote the systematic carbon budget observation in Asia and to encourage activities of observation in Asian countries with the development of the AsiaFlux network.



Proceedings of the two AsiaFlux Workshops held in 2005 and 2006



Two AsiaFlux workshops were held in 2005 and 2006, with participation from foremost experts as well as young scientists from Asia and other regions. The workshops were excellent venues to exchange and share valuable information on flux measurement and analysis methodologies, and provided opportunities to discuss and understand the current situation and

problems of each Asian country. The information was most useful for further promotion of AsiaFlux activities.

One output of this project is a technical manual summarising the results of data re-analysis and standardization of observation methods. This manual is useful to young scientists aiming for their initial capacity building in flux observation and analysis. Furthermore, an inter-comparison of measurements was carried out by using data from different types of observation methods (open- and closed-path system), and results showed a significant difference in CO₂ flux values. The results will be valuable in evaluating indexes for previously obtained data.

Publications:

- AsiaFlux Workshop Organizing Committee (Ed.). 2005. *Proceedings of AsiaFlux Workshop 2005 "International Workshop on Advanced Flux Network and Flux Evaluation"*, 96 pp.
- Lakanavichian, S. (Ed.). 2006. *Proceedings of AsiaFlux Workshop 2006 "International Workshop on Flux Estimation over Diverse Terrestrial Ecosystems in Asia"*, 113 pp.
- AsiaFlux Steering Committee (Ed.). 2006. *Practice of Flux Observations in Terrestrial Ecosystems*.

ARCP2006-02CMY-Marcotullio: Application of the Human Ecosystems Model (HEM) to Urban Environmental Management in ASEAN

Project Leader: Dr. Peter J. Marcotullio

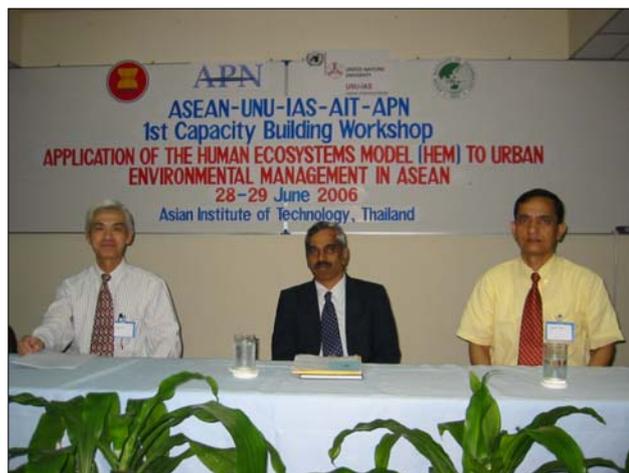
Email: pjm12@columbia.edu

Funding: US\$ 60,000 for two years

Participating Countries: Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, USA and Viet Nam

Summary: Resolving current environmental challenges in cities of Southeast Asia demands new planning and management approaches. The ecosystem approach to urban environmental management provides opportunities to reveal policy leverage points not articulated in more traditional, sectoral engineering approaches. The Human Ecosystems Model (HEM) represents an example of this new holistic, integrated thinking about cities. It presents a way to examine the relationship between the major social, economic and biophysical elements responsible for the emergence of environmental challenges, and hence provides a

roadmap for addressing harms and proposing effective actions that are locally appropriate. This project used the HEM as a basis to create a capacity building tool for the application of the ecosystem approach for ASEAN urban environmental planning and management. Specifically, water-related urban environmental issues were addressed. The project has produced a draft capacity building tool for training city managers to use the HEM, a draft guidelines policy paper on the basic principles of the HEM and how to identify policies through its application, and research papers on water challenges in ASEAN and fundamental elements of the ecosystem approach for planning.



Opening session of the 1st Capacity Building Workshop on the Application of the HEM

Publications:

- Marcotullio, P.J. 2007. Urban water-related environmental transitions in Southeast Asia, *Sustainability Science*, 2 (1): 27-54.
- Marcotullio, P.J. 2007. Ecosystem approaches and urban environmental planning, UNU-IAS Working Paper, (forthcoming).

ARCP2006-05CMY-Akimoto: Asian Ozone Pollution in Eurasian Perspective

Project Leader: Dr. Hajime Akimoto

Email: akimoto@jamstec.go.jp

Funding: US\$ 87,000 for two years

Participating Countries: China, India, Japan, Malaysia

Summary: Photochemical ozone pollution is becoming a more important regional environmental issue in various parts of Asia. However, regionally representative ozone data has not been well publicised yet. This project compiled observational data of surface ozone at remote and rural sites in Asia in a database for the discussion of regional ozone pollution. These observational data were synthesised to elucidate spatial and seasonal variability in Asia, and the intercontinental transport to and intra-continental transport of ozone in Asia were evaluated. Three workshops were also organised in Beijing, China; New Delhi,

India; and Yokohama, Japan to build the capacity of young scientists in the field of atmospheric chemistry. Selected remote/rural ozone monitoring sites were also visited.

Using the dataset of Regional Emission Inventory in Asia (REAS) developed in the Frontier Research Center for Global Change (FRCGC), analysis of the seasonal variation of the ozone in the boundary layer in East Asia using the Community Multi-Scale Air Quality Model (CMAQ) was conducted. The regional scale model was validated by the observational data of surface ozone obtained from EANET (Acid Deposition Monitoring Network in East Asia). The model successfully reproduced seasonal variations of surface ozone in the East Asian Pacific rim region. Controlling factors of ozone concentration around Japan have also been analysed by the model. Meanwhile, the contribution of



Visit to the Shiangdianzi Regional Station in Beijing, China

ozone to Asia from Europe, North America and other parts of the world was analysed using the "tagged" method by global chemical transport, revealing that ozone transport from the polluted source regions like North America, Europe and Asia generally accounts for more than 40% of ozone abundances even in remote locations.

Publications:

- Abstracts for the 1st Symposium on Asian Ozone Pollution in Eurasian Perspective, the APN Project Workshop/Seminar, Beijing, November 21-22, 2005.
- Abstracts for the 2nd Symposium on Asian Ozone Pollution in Eurasian Perspective, the APN Project Workshop/Seminar, New Delhi, November 21-22, 2006.
- Abstracts for the 3rd Symposium on Asian Ozone Pollution in Eurasian Perspective, the APN Project Workshop/Seminar, Yokohama, April 21-22, 2007.
- Sudo, K. and Akimoto, H. 2007. Global source attribution of tropospheric ozone: Long-range transport from various source regions, *J. Geophys. Res.* 112, D12302, doi:10.1029/2006JD007992.
- Yamaji, K., Ohara, T., Uno, I., Tanimoto, H., Kurokawa, J. and Akimoto, H. 2006. Analysis of the seasonal variation of ozone in the boundary layer in East Asia using the Community Multi-Scale Air Quality Model: What controls

surface ozone levels over Japan? *Atmos. Environ.* 40, 1856-1868.

ARCP2006-14NSY-Chen: Workshop on “Global Water System Hotspots in the Asian Region: Mega Cities and Dams” – 2nd GWSP-Asia Network Meeting

Project Leader: Prof. Jianyao Chen

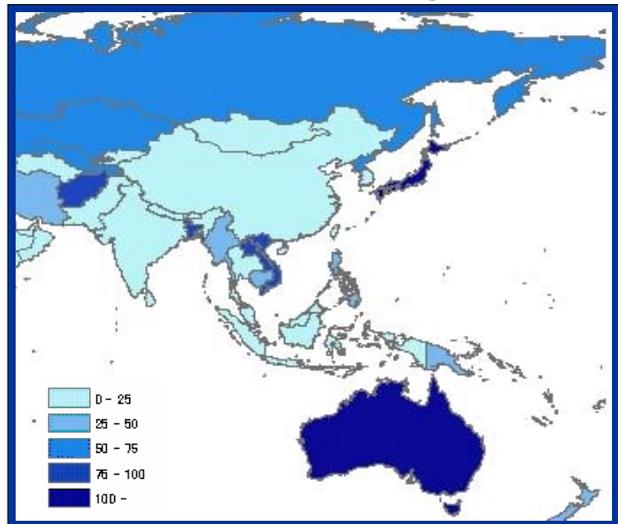
Email: chenjyao@mail.sysu.edu.cn

Funding: US\$ 24,000 for one year

Participating Countries: China (including Hong Kong), Germany, India, Indonesia, Japan, Lao PDR, Pakistan, Philippines, Sri Lanka, Thailand, USA, Viet Nam

Summary: The workshop on “Global Water System Hotspots in the Asian Region: Mega Cities and Dams” was organised by the School of Geography and Planning, Sun Yat-sen University and the International Project Office of the Global Water System Project (GWSP). Held on 8-11 June 2006, in Guangzhou, China, the workshop was a follow-up of the 1st GWSP-Asia meeting held in Kyoto, Japan in 2005. Its goals were to summarise existing state of knowledge on current cumulative impacts of mega cities and that of dams in Asia, and to set and launch a research agenda for mega cities and dams in Asia in the context of the global water system. It also aimed to create databases on dams and mega cities under the umbrella of the GWSP-Asia Network.

Cumulative impacts of mega cities and that of dams in Asia were presented by the participants with their case studies. Though the impacts of mega cities and dams were discussed separately, they are interacted in the context of stress and response: water scarcity/vulnerability in a mega city requires sustainable water supply with good water quality from dams/reservoirs and/or groundwater, while the construction of dams affected environmentally the downstream/coastal area, where a mega city is generally located. The interaction and impacts of dams and mega cities are significant in Asia from the perspective of the global water cycle and nutrient flux. Meanwhile, as the rate of geo-referenced database for dams is low for China



Percentage of geo-referenced dams to total registered dams in Asian countries

and India, where major large dams were constructed, the first version of the database focussed on data collection in these two countries. However, this needs to be improved and expanded due to the limited data collected for dams, and a training course on the database of dams/mega cities and the related hydrological analysis were proposed during the workshop.

Publications:

- Global Water System Hotspots in the Asian Region – 2nd GWSP-Asia Network Workshop, 8-11 June 2006, Guangzhou, China. Agenda and Book of Abstracts.
- Chen, J. (Ed.). 2006. Proceedings of the Global Water System Hotspots in the Asian Region – 2nd GWSP-Asia Network Workshop, 8-11 June 2006, Guangzhou, China (contains full papers and extended abstracts).

CAPaBLE

Highlights and publications for completed projects under APN's CAPaBLE Programme are included in this chapter of the Annual Report. Further details on any of the projects highlighted in this publication can be obtained by contacting the APN Secretariat at info@apn-gcr.org or visiting the APN website at www.apn-gcr.org.

2004-CB09NSY-Dharmaratna: National Climate Change Public Awareness and Outreach in Sri Lanka

Project Leader: Mr. G.H.P. Dharmaratna

Email: gdharmaratna@yahoo.com

Funding: US\$ 21,000 for twenty months

Participating Country: Sri Lanka

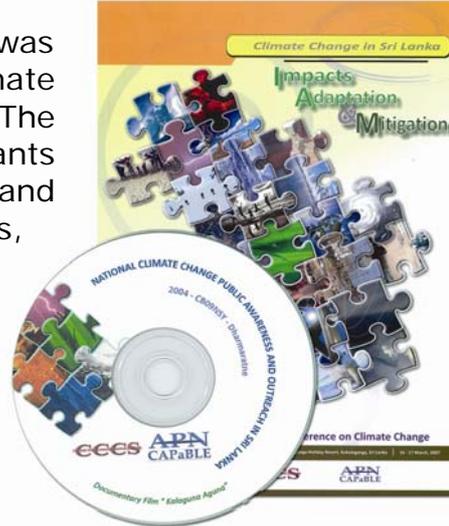
Summary: This project primarily focussed on the dissemination of information contained in the reports of IPCC Third Assessment Report (TAR) Working Groups II and III and recent findings related to climate change in Sri Lanka. As the issue of climate change is somewhat a new concept to the public in Sri Lanka, it is a pre-requisite to raise awareness on climate change issues before launching any targeted program to reduce or minimise the vulnerability of different sectors to climate change. This was accomplished by conducting 25 seminars at various administrative districts of Sri Lanka within a period of 18 months. A total of 3,448 participants attended the 25 seminars, with an average of 138 participants in each seminar, representing policy-makers, district level administrators, technical officers, private sector representatives, non-government organisations (NGOs), school children, teachers and academic experts. Each seminar focussed on the Science of Climate Change; Impacts, Adaptation and Mitigation to Climate Change in Different Sectors (agriculture, water resources, and health); and Extreme Climatic Events, including a topic specific to the respective geographical region.



Students and teachers as participants in one of the public awareness seminars conducted

Six leaflets on climate change-related issues were prepared and distributed among participants. A 30-minute documentary film named "Kalaguna Aguna" (The Adverse Effects of Climate Change) was also produced and screened at the latter seminars conducted, as well as on national television in Sri Lanka.

The major outcome of this project was the creation of awareness on climate change among stakeholders. The knowledge gained by the participants would be useful for policy-making and preparedness plans for disasters, development of technical know-how for the future, and development of school and university curricula. It is hoped that in the long term, this would help reduce the vulnerability of the economy of the country to any future climate change.



Proceedings and documentary film among the outputs of the project

Publications:

- Basnayake, B.R.S.B., Punyawardane, B.V.R., Premalal, K.H.M.S., Jayasinghearachchi, D.A. and Kumarasinghe, N. 2007. *Climate Change in Sri Lanka: Impacts, Adaptation and Mitigation*. Proceedings of the National Conference on Climate Change, 16-17 March 2007, Kukulegang, Sri Lanka. Centre for Climate Change Studies (CCCS), Department of Meteorology, Colombo, Sri Lanka.
- Documentary Film "Kalaguna Aguna" (The Adverse Effects of Climate Change).

2005-CB04CMY-Koshy: Training Institute on Climate and Extreme Events in the Pacific

Project Leader: Dr. Kanayathu Koshy

Email: koshy_k@usp.ac.fj

Funding: US\$ 150,000 for three years

Participating Countries: Fiji, New Zealand, Pacific Island Countries and USA

Summary: The overarching goal of the Training Institute project was to enhance the regional network of scientists, forecasters, disaster management officials, sectoral field workers and resource managers to enhance the capacity of Pacific Island

jurisdictions to understand, anticipate and effectively respond to the consequences of current and future patterns of climate variability and climate-related extreme events such as droughts, floods and tropical cyclones both today and in the future.

Three workshops were conducted in Suva, Samoa and Kiribati, and each was designed to be an intensive, two-week program of lectures, hands-on experience with climate forecasting and risk assessment tools, small group discussions, media training, and shared exploration of adaptation and mitigation policy options, and a role play to put into practice the skills developed during the workshop.

About 30 participants from eleven Pacific Island Countries participated in the inaugural training in Suva (2004). This was followed by two in-country trainings in Samoa (2005) and Kiribati (2006), both attended by about 35 participants representing a wide spectrum of stakeholders, including government, community and other non-state actors.

The feedback, both direct and indirect, revealed that the training was well conceived, planned and delivered to suit the regional and national capacity needs of the countries concerned to address the implications of current and future climatic impacts, the resulting vulnerability and adaptation implementation.

This project was conducted as a collaborative effort combining the expertise, assets and capabilities of the University of the South Pacific (USP), the East-West Center (EWC) and the New Zealand National Institute of Water and Atmospheric Research (NIWA). Additional financial and in-kind support for the Training Institute was provided by the U.S. National Oceanic and



From top to bottom: Participants at the Training Institutes in Suva, Samoa and Kiribati

Atmospheric Administration (NOAA), EWC, NIWA and USP and a host of other regional and international organisations.

Publications:

- Summaries of the Training Institutes' reports were published in *Oceanic Waves*, a quarterly newsletter published by the START Oceania Secretariat.
- Pacific Regional Training Institute Climate Extreme Events, 2004. *Oceanic Waves*, Volume 6, Issues 3 & 4, October 2004 (www.usp.ac.fj/start/).
- Samoa Training Institute Climate Extreme Events, 2005. *Oceanic Waves*, Volume 7, Issue 2, May 2005, (www.usp.ac.fj/start/).
- Kiribati Training Institute Climate Extreme Events, 2006. *Oceanic Waves*, Volume 8, Issue 3, September 2007, (www.usp.ac.fj/start/).
- Newspaper articles in Fiji, Samoa and Kiribati.

2005-CB07NSY-leng: Development of a 'Mobile Environmental Education Program' to Raise Awareness about Climate Change in Cambodia

Project Leader: Mr. Sovannora leng

Email: phil@camangkor.com

Funding: US\$ 40,000 for one year

Participating Country: Cambodia

Summary: The Mobile Environmental Education Program (MEEP) represents an innovative means to increase awareness about the causes and impacts of climate change in Cambodia. It has two main objectives: 1) educating students and opinion-formers on the impacts of climate change and environmental degradation in Cambodia; and 2) helping students develop a basic understanding of scientific issues and techniques in measuring and monitoring environmental impacts. The Tonle Sap Lake was the initial study site of the program.

The MEEP design intends to achieve the above objectives through the creation of an environment, in which participants experience guided observations of



Consultation with the community on the feasibility of MEEP

environmental impacts around Tonle Sap, undertake basic scientific tests and experiments, and participate in moderated discussions on climate change and the environment. The use of a floating education centre along Tonle Sap makes such education more relevant to participants, allowing them to witness impacts at first-hand in an area of great economic and cultural significance to Cambodia. It is planned that MEEP will be undertaken as a public-private partnership, and will increasingly become self-financing from participant fees.

CAPaBLE funding was used to develop a feasibility study for MEEP, including an extensive community consultation process. An implementation plan and project design were developed, results of which would be the basis for implementing the initial partnership. Overall, MEEP was considered an interesting model for furthering the goals of enhanced environmental awareness and education in Cambodia, and in developing countries more generally. The design process has emphasised, however, the importance of the program being sustainable as well as consultation with local communities to ensure their commitment to support the project. Further work for MEEP involves preparation and submission of detailed funding proposals to potential donors for its implementation.

Publication:

- Information leaflet in English and Khmer introducing the MEEP concept.

CBA2006-01NSY-Manner: Capacity Building and Meeting Research Needs on the Ecology of Global Change in Island Landscapes of the Republic of Palau

Project Leader: Dr. Harley Manner

Email: hmanner@uog9.uog.edu

Funding: US\$ 42,000

Participating Countries: Fiji, Japan, Republic of Palau, Samoa and USA

Summary: The Pacific-Asia-Biodiversity Transect Network (PABITRA) is a program of the Ecosystem Division in the Pacific Science Association (PSA) Task Force on Biodiversity. Its aim is to collaborate with Pacific Islanders on biodiversity research and ecosystem conservation. Its research strategy is two-fold: to encourage comparative studies across Oceania in ecosystems that belong to the same biomes (the horizontal strategy) and to study selected island landscapes from the mountains to the

ocean (the vertical strategy). Following on two PABITRA capacity building workshops held in Fiji and Samoa, this CAPaBLE project aimed to train Palauan students/scientists in the methods of ecological analysis so that they can conduct studies and data collection that the country will need for policy development.

In collaboration with the Palau Natural Resources Council (PNRC), PABITRA held two workshops in Koror, Palau. The first was an Initial Planning and Scoping Workshop held on 7-11 August 2006 to initiate a synthesis of existing work on Palau ecosystems and to promote the analysis of new research on the ecology of global change in island landscapes. Techniques for data collection and interpretation using the PABITRA online manual for integrated assessment of biodiversity were presented. Already existing information on the Palauan environment and base data were brought together and the needs for new ecological approaches were clarified.

The second was the Joint Analysis and Synthesis Workshop, held on 25 March - 2 April 2007 to initiate studies of selected Palauan ecosystems using transect and watershed approach. The workshop began with a reconnaissance trip of Babeldaob Island, which was useful for selecting potential sites for field training, long-term monitoring and installation of meteorological stations. The Palauan participants reported on accomplished work since the Initial Meeting and the PABITRA experts presented on further methods of biodiversity assessment, such as basic statistics and their ecological applications, mapping with PowerPoint, among others. Field training exercises were also performed, and inexpensive meteorological stations were built with nearby stream gauging stations for enhanced understanding of watershed functioning.



Field training exercise on the finer points of species identification at Ngerikiil Watershed in Airai State, Babeldaob Island

Publications:

- Kitalong, A. and Costion, C. 2007. A forest survey of Babeldaob, Palau: Floristic diversity, plant communities, and conservation recommendations. Paper presented at the 21st Pacific Science Congress, June 12-18, 2007, Okinawa.

- Mueller-Dombois, D., Bridges, K. W. and Daehler, C. (Eds.). 2007. *Biodiversity Assessment of Tropical Island Ecosystems: PABITRA Manual for Interactive Ecology and Management*. Bishop Museum Press, Honolulu, HI (in press).

CBA2006-02NSY-ESSP: ESSP's 2nd Young Scientists' Global Change Conference (YSC) and Open Science Conference (OSC)

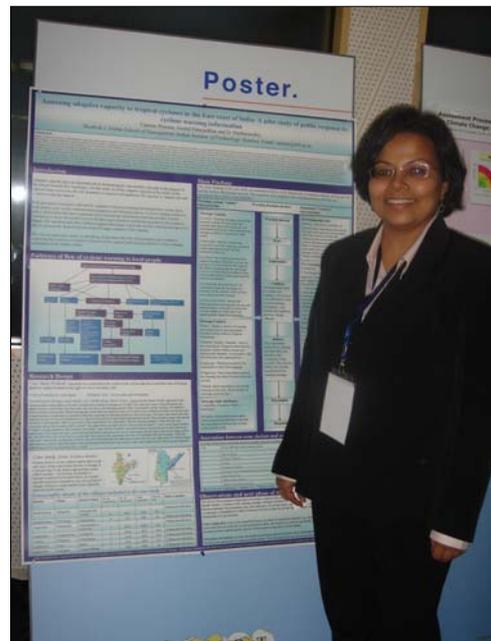
Project Leaders: Prof. Roland Fuchs and Prof. Qin Dahe

Email: rfuchs@agu.org; cdccc@cma.gov.cn

Funding: US\$ 75,000

Participating Countries: Global activity

Summary: The 2nd International Young Scientists' Global Change Conference (YSC) took place on 5-8 November 2006, in Beijing, China. The conference offered a prestigious platform for young scientists to present their research findings to one another and leading scientists in the region. Some 100 participants from 35 countries were selected by international review panels from over 700 applications. APN support made possible participation of 30 young scientists from the Asia-Pacific region. Distinguished invited keynote speakers included Prof. Congbin Fu and Nobel Laureate Paul Crutzen. Sessions were also chaired by leading members of the global change research community. The YSC fully achieved its objectives in stimulating research across a broad spectrum of global change science including: exchange of research findings, exposure to new concepts, building self-confidence, encouraging a high degree of interaction among young and more senior scientists, and furthering personal and professional network development. All participants were encouraged to develop their papers and presentations into full-length papers for submission to peer-reviewed journals.



APN-funded participant presenting her poster at the YSC

Back to back to the YSC, the Earth System Science Partnership (ESSP) Open Science Conference was held on 9-12 November 2006 at the Beijing International Convention Center in Beijing,

China. The conference was also a major success with over 900 scientists, policy-makers and journalists in attendance. The next generation of Earth System Science researchers was also in attendance following the successful YSC. Highlights of the ESSP OSC included an impressive variety of keynote presentations on advances in Global Environmental Change to Earth System Science and the way forward. There were 44 parallel sessions ranging from Monsoon Asia to the future of Earth System Modelling to the governance of water, food and carbon and over 500 poster presentations. Major outcomes of the conference included the launch of the Monsoon Asia Integrated Regional Study (MAIRS) Initial Science Plan. The OSC also delivered a message of urgency to governments to take action on issues of global environmental change and sustainable development.



Plenary session during the ESSP OSC

Publications:

- 2nd International Young Scientists' Global Change Conference Abstract Book.
- A special journal issue, organised by participants is now in process.
- ESSP Open Science Conference Programme and Abstract Book.

CBA2006-03NSY-Sevilla: Integrated Participatory Analysis of Sustainability in the Greater Mekong Sub-Region

Project Leader: Dr. Ramon Sevilla

Email: ramon@mekonginstitute.org

Funding: US\$ 28,000

Participating Countries: Cambodia, China, Japan, Lao PDR, Myanmar, Thailand and Viet Nam

Summary: A research training program on "Assessing Sustainable Development in the Greater Mekong Sub-region (GMS)" was organised by the Mekong Institute (MI) and Liphe4 Scientific Association on 21 May - 1 June 2007. It aimed to train young researchers and young professionals on methods and tools for analysing issues related to global change in an integrated and participatory way. The activities included an intensive training

course, policy dialogue (participatory support for problem structuring and awareness raising), and dissemination (transfer of scientific knowledge to the policy sector and the public). Nineteen participants from seven countries attended the training which was conducted by internationally renowned experts in the fields of integrated analysis, participatory research and sustainability research. The training dealt with issues on the aspects of global change research, including land use and land cover change, food and water security, and agricultural practices. Emphasis was given to the socio-economic drivers of global change and the intervention in social systems for sustainable development. At the end of the training, the participants presented research proposals applying the lessons learned from the training and identified four research topics: integrated assessment of community-based tourism (quality tourism); rural development and the issue of water; rural development within a changing economy; and studying the options of organic agriculture development. It is expected that the research teams formed during the training will continue to work on the above research topics proposed with strong support from project partners and resource persons.



Small groups discussing their research proposals during the training

Publications:

- MI produced and distributed CD-ROMs to all participants on the final day of the training. The information can also be downloaded in the Research Section of the MI webpage (www.mekonginstitute.org).
- MI produced a hard copy of the training completion report with evaluation from resource persons and participants about the course delivery.
- The outcomes of the research in the GMS will be published in special issues of the Mekong Institute Journal *Review of Development and Cooperation*.
- Special technical writings were published in the MI quarterly publication (MI Newsletter – Mekong Connection) in the July 2007 issue.

CBA2006-06NSY-Towprayoon: Greenhouse Gas (GHG) and Aerosol Emissions under Different Vegetation Land Use in the Mekong River Basin Sub-region

Project Leader: Dr. Sirintornthep Towprayoon

Email: sirin@jgsee.kmutt.ac.th

Funding: US\$ 30,000

Participating Countries: Australia, Cambodia, Japan, Thailand, USA and Viet Nam

Summary: The mitigation of GHG and aerosol emissions from biogenic sources and biomass burning activities associated with different vegetation land use requires transfer of know-how to regional scientists to develop appropriate emission inventories. This project aimed: 1) to provide capacity building to scientists of the Mekong River Basin Sub-Region (MRBSR) on emission inventory of GHGs and aerosols from biogenic and biomass burning activities associated with different vegetation land use; and 2) to provide scientifically sound decision support information to policy-makers for the formulation and implementation of control strategies to improve regional air quality and to mitigate global warming, for the sustainable development of the region.



Transfer and set-up of field experimental procedures for measurement of GHGs from forest and paddy fields to counterparts in Cambodia

The objectives were achieved through three main activities. First, classification of vegetation land use and the set-up of Geographic Information System (GIS) maps of emissions from biogenic and biomass burning activities were done in the MRBSR, particularly in Thailand, Cambodia, Lao PDR and Viet Nam. Secondly, methodologies developed in Thailand were shared with counterparts in Cambodia through hands-on training, including the set-up of experimental procedures. Finally, an international training workshop entitled "Inventories of Greenhouse Gases and Aerosol Emissions Associated with Different Types of Vegetation and Land Use in the Mekong River Basin Sub-region" was organised on 1-3 May 2007, in Bangkok, Thailand.

Based on the above activities, it was concluded that biogenic and biomass burning constitutes a major source of air pollutants in the region, especially GHGs and aerosols. The transferred

methodologies and experimental procedures have also been evaluated as appropriate for measuring and monitoring local parameters related to biogenic and biomass burning emissions. They were seen to be sufficiently simple to be well-assimilated and efficiently implemented. Furthermore, through the international training workshop conducted, more than 30 scientists and policy-makers from MRBSR were trained on the capacity building framework and scientifically sound decision support information to improve the regional GHG and aerosol emission inventory.

Publications:

- CD-ROMs and workshop materials of the international training workshop on “Inventories of Greenhouse Gases and Aerosol Emissions Associated with Different Vegetation Land Use in the MRBSR”, organised during 1-3 May 2007 in Bangkok, have been produced and provided to all participants.
- Two international journal publications and conference papers on the results obtained via this project are also planned during the period of 2007-2008.

**CBA2006-07NSY-Lebel/AOA2006-01NSY-IHDP:
Institutional Dimensions of Global Environmental Change:
Water, Trade and Environment**

Project Leaders: Dr. Louis Lebel and Ms. Elisabeth Mullin

Email: louis@sea-user.org; mullin@ihdp.unu.edu

Funding: US\$ 60,000

Participating Countries: Global activity

Summary: The 5th biennial International Human Dimensions Workshop (IHDW) of the International Human Dimensions Programme on Global Environmental Change (IHDP) encompassed 41 participants and took place on 13-26 October 2006, in Chiang Mai, Thailand. This IHDW, with the theme “Water, Trade, and Environment – the Institutional Dimensions of Global Environmental Change”, was done in partnership with APN, which given its physical location



One of the breakout groups during the science-policy dialogue at the IHDW

in Asia and strong involvement of Asia-Pacific participants, trainers and case studies, was a huge benefit to the workshop.

The two main components of the IHDW 2006 were plenary sessions and working groups consisting of up to eight people. The main focus was “institutional analysis”, complemented by discourse analysis, rights-based approaches, as well as scenario building and negotiation games. In addition, a “participants’ seminar series” took place, in order to develop individual or group-based research proposals. A “trainer’s table”, a Science-Practice Dialogue, and four field trips to water-related sites were important components. Finally, several side-talks and meetings took place throughout the workshop. The final session was organised by the participants, who presented the outcomes of the two-week’s work and their evaluations.

The outcomes of the IHDW were numerous, and most of them will continue to be followed up upon and harvested in the future. Among these, five working groups were formed in order to develop participants’ existing research proposals further and initiate new ones. Both individual and group-based research ideas were presented on the last day. Particularly promising are (partly collective) research efforts on drylands, transboundary water management, water and climate change, and water needs for biofuels as well as virtual water flows. Furthermore, several other bilateral research ideas are currently being explored, such as joint articles and several kinds of future collaboration and cross-fertilisation.

Publication:

- A CD-ROM was distributed to the participants.

CBA2006-08NSY-Salinger: International Workshop on Coping with Agrometeorological Risks and Uncertainties: Challenges and Opportunities, 16-18 October 2006, New Delhi, India

Project Leader: Dr. M.J. Salinger

Email: j.salinger@niwa.co.nz

Funding: US\$ 20,000

Participating Countries: Global activity

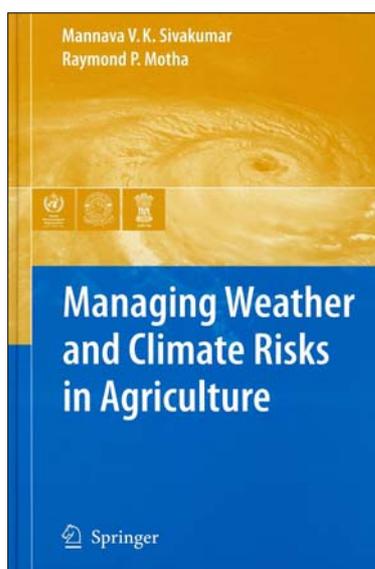
Summary: The overarching objective of the workshop was to enhance the international network of scientists, forecasters, disaster management officials and resource managers skilled in agrometeorology in the use of climate information to increase the

resilience of nations to cope with agrometeorological risks and uncertainties in different parts of the world. The workshop brought together leading experts who presented 27 state-of-the-art discussion papers to address and develop strategies to cope with agrometeorological risks and uncertainties. In many parts of the world, climate change and extreme climatic events such as severe droughts, floods, storms, tropical cyclones, heat waves, freezes and extreme winds pose one of the biggest production risk and uncertainty factors impacting on agricultural systems performance and management. One of the most important coping strategies is improved use of climate knowledge and technology, which includes the development of monitoring and response mechanisms to current weather and future climate change.



Participants at the workshop

The project provided scientists from 11 APN emerging and developing countries the opportunity to interact with experts from different regions. Capacity building in the area of coping strategies for weather and climate risks contributes to sustainable agricultural development, especially in the Asia-Pacific region. The workshop programme was designed to engage all the participants in discussions and develop appropriate recommendations. As workshop outputs, a range of recommendations and policy options to cope with agrometeorological risks were presented. These included contingency planning, use of crop simulation modelling, and use of agrometeorological services. The workshop also promoted linkages between various national, regional and international institutions who participated in the workshop, and such linkages are crucial for the successful implementation of appropriate case studies in different APN countries that will test and validate the various climatic risk management strategies.



Publications:

- Sivakumar, M.V.K. and Motha, R.P. (Eds.). 2007. *Managing Weather and Climate Risks in Agriculture*. Springer, 504 pp.

- CD-ROM of draft papers for the International Workshop on Agrometeorological Risk Management: Challenges and Opportunities (distributed prior to the workshop).
- CD-ROM of presentations for the International Workshop (distributed at the end of the workshop).

CBA2006-09NSY-Raha: Scoping Workshop on South Asia Rapid Assessment Project's (SARAP) Results for Designing Future Research Agenda and Capacity Building Requirements

Project Leader: Prof. Sibaji Raha

Email: sibajiraha@bic.boseinst.ernet.in

Funding: US\$ 20,000

Participating Countries: Australia, Bangladesh, India, Nepal, Pakistan, Sri Lanka and USA

Summary: The APN-sponsored workshop took place in the Darjeeling Campus of the Bose Institute, Kolkata, India, on 8-11 October 2006. SARAP, under MAIRS, synthesised global change-related research in South Asia, which included all the components of physical



*Participants
at the
SARAP
Scoping
Workshop*

and human dimensions of change in the Earth system (viz. climate, ecosystem, atmosphere, resources and sustainable development). The workshop was attended by authors of different chapters of the SARAP book volume, South Asian global change researchers, members of the South Asian START Committee (SASCOM), and representatives of international programme offices of the Global Carbon Project (GCP) and MAIRS.

During the workshop, detailed discussions took place on the regional synthesis efforts of global change research in South Asia and views were exchanged between lead authors of different chapters and other workshop participants on issues which have been identified during the synthesis efforts on capacity building relevant to the South Asian region. This discussion was greatly facilitated by the expositions made by the international programme offices of the GCP and MAIRS besides other Indian global change research efforts which provided focussed

perspectives of international and regional programmes for possible integration. The final outcome of the workshop resulted in the adoption of the following recommendations: Himalayas and the Indo-Gangetic Plain, coastal zones and monsoon stability as the priority research themes for South Asia; the need for capacity building at both institutional and individual levels in South Asia in various areas of global change and the encouragement of inter-intra regional collaboration; and the need for a proper mechanism for data archiving and dissemination.



APN-sponsored SARAP Scoping Workshop in the local news

The workshop ended with a visit around the Darjeeling Campus of the Bose Institute. The workshop was elaborately covered by local newspapers and raised awareness among local stakeholders on key issues related to global change from South Asian perspectives.

Publication:

- Proceedings containing the draft SARAP book volume was prepared and distributed. This served as the base document on which comments and suggestions were made for further improvement. The final draft of the SARAP book volume will be published by SASCOM with START's support.

CBA2006-10NSY-Sari: Institutional Dimensions of Global Environmental Change (IDGEC) Synthesis Conference; Institutions for Sustainable Development in the Face of Global Environmental Change: Questioning-Explaining-Demystifying

Project Leader: Dr. Agus Sari

Email: agus.sari@ecosecurities.com

Funding: US\$ 20,000

Participating Countries: Global activity

Summary: The IDGEC Synthesis Conference was designed to distill and harvest the results of almost a decade of research on the institutional dimensions of global environmental change. The

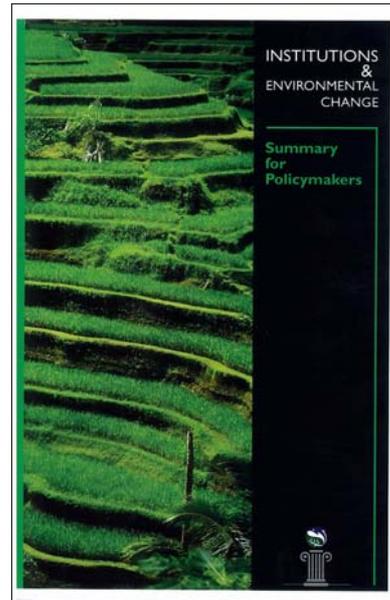
conference was held in Bali, Indonesia on 6-9 December 2006. It constituted the focal point of the final stage in the lifecycle of a core project operating under the auspices of the IHDP. The conference brought together academic researchers, policy-makers, and leaders in the global environmental field to participate in a wide range of fora including paper and poster presentations on the major areas of research findings, workshops, and discussion groups, and events to ensure maximum interaction and learning. Presentations and debates reviewed the substance and significance of research in order to identify knowledge produced in the areas of: a) the IDGEC Research Foci, i.e., causality, performance and design; and b) the project's Analytic Themes, i.e., problems of fit, interplay and scale.

The results of the synthesis have been written up for publication, which include several edited volumes that summarise IDGEC research findings. IDGEC results constitute an important contribution to the New Institutionalism of the social sciences. In continued development of investigation, leading researchers have initiated a process to form a new core project under the IHDP on Earth System Governance (ESG).

The conference also helped to identify deficits in institutional capacity for addressing environmental problems in developing countries of origin of both junior and senior scientists attending. This will help the ESG project target areas of enquiry and maintain ties with scientists interested in producing case studies and with decision-makers seeking policy guidance. The expanded focus on institutions as instruments within larger, complex systems of governance increases the potential of IDGEC and ESG research to bridge the science-policy gap, helping to produce effective decisions that successfully address global environmental change.

Publications:

- Alcock, F. (Ed.). *The Politics of Property Rights in Fisheries* (under review).
- Biermann, F. and Siebenhuener, B. (Eds.). *Managers of Global Change: The Influence of International Bureaucracies in Environmental Governance* (being submitted to MIT Press).



An IDGEC publication summarising a decade of research on the question of whether institutions matter in tackling environmental problems

- Chambers, W.B., Kim, J.A. and Young, O.R. (Eds.). *Institutional Interplay: The Case of Biosafety*. In print, UNU Press.
- Gupta, J. and Huitema, D. (Eds.). *Scale in Environmental Governance: A theoretical and empirical exploration of the concept of scale and its relevance for environmental governance* (submitted to MIT Press).
- Oberthuer, S. and Stokke, O.S. (Eds.). *Institutional Interplay and Global Environmental Change. State of the Art and Perspectives* (in preparation).
- Young, O.R., King, L.A. and Schroeder, H. (Eds.). *Institutions and Environmental Change: Principal Findings, Applications, and Research Frontiers* (being submitted to MIT Press).
- *IHDP Update* (1/2007).
- Young, O.R., King, L.A. and Schroeder, H. 2008. *Institutions and Environmental Change: Summary for Policy-Makers*. Institutional Dimensions of Global Environmental Change.

CBA2006-11NSY-Dai: Strengthening Scientific Capacity in the Surface Ocean Lower Atmosphere Study (SOLAS): The 2007 SOLAS Open Science Meeting in Xiamen, China

Project Leader: Prof. Minhan Dai

Email: mdai@xmu.edu.cn

Funding: US\$ 20,000

Participating Countries: Global activity

Summary: SOLAS is a core project of the International Geosphere - Biosphere Programme (IGBP). SOLAS research strives to resolve the biogeochemical interactions between the air and sea, and the investigation of changes to air-sea interaction is one of the fundamental keys to understanding future global climate.

The third SOLAS Open Science Meeting was conducted from 6-9 March 2007, at the Xiamen International Conference and Exhibition Center in Xiamen, Fujian Province, China. The meeting aimed to provide a forum for open exchange of ideas and development of collaboration among the scientist and student



SOLAS OSC Brochure

participants. Two hundred and twenty-five scientists, students, and policy-makers from 30 nations attended the conference, and APN supported 17 participants from Bangladesh, China, India, Indonesia, Japan, Republic of Korea, Thailand and USA. The format for the meeting was chosen to provide substantial expertise and intellectual stimulation from a series of daily plenary talks (21 in all), long duration poster sessions which provided sufficient time and space for meaningful interactions between scientists and students (3 sessions), and afternoon planning and synthesis sessions where the community could gather in relatively moderate-sized groups to develop new plans for those areas of SOLAS science deserving of new stimulation (11 sessions). Feedback from the participants strongly indicated that the conference was a success. The long-term legacy of this project remains to be seen, as relationships developed will be instrumental in the development of research directions within the APN region and internationally for the next generation.

Publications:

- A conference brochure was produced and provided to each participant.
- A special issue of the *SOLAS Newsletter* (Issue 5) focussed on the Open Science Meeting.

Peer-Reviewed Publications

In addition to the publications listed previously, the below also lists papers published prior to, and in 2006/2007 as a result of the funding contributions provided by APN.

2003-CB08-1-WCRP/Laprise

Barring, L. and Laprise, R. (Eds.). 2005. Extended Abstracts of a WMO/WCRP-sponsored Regional-Scale Climate Modelling Workshop on High-Resolution Climate Modelling: Assessment, Added Value and Applications. 29 March – 2 April 2004, Lund, Sweden, 131 pp.

2003-CB08-2-WCRP/Determmerman

AMS Journal of Climate. Special Section: 1st World Climate Research Programme (WCRP) Climate Variability and Predictability (CLIVAR) Science Conference. Volume 19, Issue 20 (October 2006), pp. 4975-5464.

2004-01CMY-Meinke

Kumar, K.K., Rajagopalan, B., Hoerling, M., Bates, G. and Cane, M. 2006. Unraveling the Mystery of Indian Monsoon Failure during El Niño. *Science* 314, 115, DOI: 10.1126/science.1131152.

2004-02CMY-Muhammed

Muhammed, A., Mirza, M.M.Z. and Stewart, B.A. (Eds.). 2007. *Climate and Water Resources in South Asia: Vulnerability and Adaptation*. Islamabad, Pakistan: Asianics Agro Dev. International.

2004-07CMY-Lasco

Lebel, L., Garden, P., Banaticla, M.R.N., Lasco, R.D., Contreras, A., Mitra, A.P., Sharma, C., Nguyen, H.T., Ooi, G.L. and Sari, A. 2007. Integrating carbon management into the development strategies of urbanizing regions in Asia: Implications of urban function, form, and role. *Journal of Industrial Ecology*, 11 (2): 61-81.

2004-16NSY-Taniguchi

Burnett, W.C., Wattayakorn, G., Taniguchi, M., Dulaiova, H., Sojisuporn, P., Rungsupa, S. and Ishitobi, S. 2007. Groundwater-derived nutrient inputs to the upper Gulf of Thailand. *Continental Shelf Research*, 27(2), 176-190.

2004-17NSY-Gadgil

Sivakumar, M.V.K. and Hansen, J.W. (Eds.). 2007. *Climate Prediction and Agriculture: Advances and Challenges*. Springer, 306 pp.

2004-CB01-NSY-Dutta

Dutta, D. and Bhuiyan, J.A.N. 2007. Flood characteristics under changing climatic conditions in Meghna Delta, Bangladesh. *Proceedings of the 16th IASTED International Conference on Applied Simulation and Modelling*, Spain, 29-31 August 2007, pp. 162-167.

Dutta, D. 2007. Flood vulnerability of coastal cities to sea level rise and potential socio-economic impacts: A case study in Bangkok. *The Science and Practice of Flood Disaster Management in Urbanizing Monsoon Asia*, International Workshop, Chiang Mai, Thailand, 4-5 April 2007, pp. 7-8.

Habib-ur-Rehman, Khan, N.M. and Dutta, D. 2006. Assessment of extent of flooding under climate change condition in coastal city of Pakistan. In: Sing, V.J. and Y.J. Xu (Eds.), *Coastal Hydrology and Processes*. Water Resources Publications, LLC, CO USA, pp. 89-102.

Dutta, D. and Niu, S. 2005. Impact of Sea Level Rising on Flooding in Coastal Cities: A Case Study in Bangkok, Thailand. *Seisan-Kenkyu, Journal of Institute of Industrial Science*, University of Tokyo, 57 (4): 146-149.

Dutta, D. 2005. Vulnerability of Coastal Cities of Asia to Rising Sea Level: A Case Study in Bangkok. *Proceedings of the Fourth International Symposium on New Technologies for Urban Safety of Mega Cities in Asia*. Nanyang Technological University, Singapore, 18-19 October 2006, pp. 203-212.

Dutta, D. and Niu, S. 2005. Modeling of floods in coastal cities under sea level rising scenarios: A case study in Bangkok, Thailand. *Proceedings of the MTERM International Conference*, Asian Institute of Technology, June 2005, pp. 323-330.

2005-01CMY-Nikitina

Lebel, L. and Sinh, B.T. 2007. Politics of floods and disasters. In: Lebel, L., Dore, J., Daniel, R. and Koma, Y.S. (Eds.). *Democratizing Water Governance in the Mekong Region*. Mekong Press, Chiang Mai, Thailand, pp. 37-54.

Lebel, L., Manuta, B.J. and Garden, P. 2005. Vulnerability to changes in flood regimes in Thailand: social practices and institutional capacity. Unit for Social Environmental Research (USER) Working Paper WP-2005-10. USER, Chiang Mai University, Chiang Mai (This paper is being submitted to the journal *Regional Environmental Change*).

Lebel, L., Foran, T. and Garden, P. 2007. Adaptation to climate change and social justice: challenges for flood and disaster management in Thailand. USER Working Paper WP-2007-12. USER, Chiang Mai University, Chiang Mai (This paper is being prepared as a chapter in the book *Climate Change Adaptation in the Water Sector*, edited by Fulco Ludwig, Pavel Kabat *et. al.*).

Lebel, L., Khrutmuang, S. and Manuta, J. 2006. Tales from the margins: small fishers in post-Tsunami Thailand. *Disaster Prevention and Management*, 15: 124-134.

1) IHDP-APN International Human Dimensions Workshop (IHDW); Institutional Dimensions of Global Environmental Change: Water, Trade and Environment, 13-26 October 2006, Chiang Mai, Thailand



I am pleased to be given an opportunity to write about my experiences while attending the 5th IHDP Workshop on Water, Trade and Environment. During the workshop, I was able to learn about emerging issues of water governance in the realm of globalisation and rising pressures of climate change. The lectures given by the resource persons and practitioners were a robust source of scientific information, as well as the discussions on institutional analysis. The group dynamics and field visits likewise helped me appreciate the interests and

resources of various stakeholders especially with regard to water resources management. Most importantly, the informal exchange of ideas and experiences among the participants and facilitators further enhanced my understanding of issues related to trans-boundary water resources and international trade.

My participation during discussions with workshop participants gave me a deeper understanding of the often-at-times contrasting views on economic development vis-à-vis environmental protection and management. Similarly, the diversity of participants, in terms of professional and academic background, widened my individual and institutional network of information, experts and researchers. After attending the 5th IHDW in Chiang Mai, I am now able to solicit technical inputs and seek financing opportunities for my own on-going and future research activities.

The hosts of the workshop chose a very appropriate venue for the workshop on water governance and water resources related problems. Together with more than 40 participants, I was able to explore the watershed area in Northern Thailand and had first-hand experience on sustainable watershed management systems.

In addition, Thailand provides useful cases of environmental disaster and risk management from which researchers and managers from other developing countries can draw valuable lessons. Lastly, because of its mountain views, tribal villages and food abundance, Chiang Mai inspired us to be more passionate about what we do as individual researchers and more dedicated in what we all desire to do as a research community. Thank you to the APN for supporting my participation to the workshop!

Herminia Caringal

Senate of the Philippines

Pasay City, Philippines

Email: herminia200@yahoo.com

As an APN-Funded participant, I felt very grateful to be chosen to participate in the APN-IHDP Workshop 2006 in Chiang Mai from 13-26 October. The workshop enhanced my view upon institutional issues related to environment, particularly to water.



For me, the highlight of this workshop was the chance to meet so many wonderful people interested in the same field. To judge a workshop's success, I feel that it is important that a contact network among young researchers and between trainers and trainees is established. This workshop was certainly a success. Many of the trainees, including myself, are newcomers to the field of global change. For many of us, we tend to focus on the natural sciences, without considering the effects of human actions. This workshop helped me gain insight to the human dimensions of global change from trainers, coordinators and participants alike. I realised that apart from the physical environment and global change issues, there are still a lot of human dimension issues that need to be addressed to take care of our planet and nurture human life.

Although the workshop was a very intensive training program, the lectures with dialogue, debates and working group activities, provided us with a variety of working formats. Because of our enthusiasm for these different working formats, we were inspired to come up with new ideas and possible research proposals. It

was a learning experience for young scientists that I hope provided the chance for collaborative research initiatives. As young scientists, it is challenging to find opportunities to receive funding for our research proposals. This workshop has inspired me and given me the confidence to prepare my own research proposal. A proposal on “Water Trade between Boundaries” is now underway. I would like to convey my gratitude to the organisers and sponsors of the workshop, and congratulate all of you for the efficiency of the work conducted during the workshop, including the preparation, efforts, contents, and human interactions. Particularly, I would like to thank the APN for their generous support.

Wei Xiong

Institute of Environment and
Sustainable Development for Agriculture
Beijing, China

Email: xiongw@ami.ac.cn

2) 2nd International Young Scientists' Global Change Conference, 5-8 November 2006, Beijing, China

The YSC and OSC conferences provided me with a great opportunity to increase my understanding of the research and problems in the field of atmospheric sciences. I was able to interact with many world known scientists including the Nobel Prize laureate Dr. Paul J. Crutzen. During the poster presentation, I came across many suggestions about my work which definitely increased my vision to polish this study in a more scientific way.

At the OSC, many different lectures from experienced scientists of the world have increased my knowledge in the field of climate modelling as well as climate systems. My participation in the YSC has definitely helped me in developing my interest and vision for my research and scientific career. In the end, I am very thankful to APN for funding my participation in this activity.



Siraj Ul Islam

Global Change Impact Studies Centre
Islamabad, Pakistan

Email: gcisc@comsats.net.pk

Abstract: Future change in the frequency of warm and cold spell durations over Pakistan simulated by the PRECIS regional climate model

Siraj Ul Islam and Nadia Rehman

The prospect of climate change caused by anthropogenic activities has generated a variety of research focussed on investigating the past climate and predicting the climate of the future using different climate models. Climate indices are valuable to evaluate the potential impact of climate change on our activities, agriculture and economy and they are also useful to monitor climate change on a global basis. The objective of this work is to present a study of the model simulated future variations in the frequency of warm and cold spell durations over Pakistan.

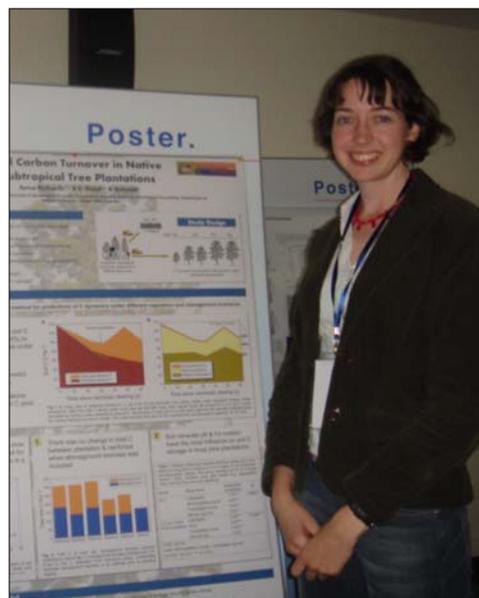
The analysis of future change in the frequency was done on the basis of a running 30 years simulations with the PRECIS regional climate model at a horizontal resolution of 50 km. Observed temperature maxima (Tx) and minima (Tn) for the 1961-1990 period at 18 stations in Pakistan are compared with their nearest corresponding PRECIS grid-box data. Furthermore, some work has been undertaken on how to use single-station observations to evaluate RCM grid-box values. This limits the ability to assess model skills in complex terrain regions. Simulation for the period 1961-1990 represents the recent climate and simulation for the period 2071-2100 represents the future climate, that is, after a doubling of atmospheric CO₂ concentration compared to recent conditions. These simulations are driven by lateral boundary conditions from GCM HadAM3P of the Hadley Centre UK.

The first part of the work aimed at finding the observed frequency of warm and cold spells. We started with the assessment of the performance of the PRECIS model regarding these particular indices of climate over Pakistan. This was done by comparing base-line simulated climatology of the model with observed station data. Observational daily minimum and maximum temperature data set for the period 1961-90 was first interpolated in the grided form to make comparison possible.

By using statistical tools, the indices for these spells were then calculated by first transforming model daily output data to the station level and then these simulated station data were compared with observed station data sets for validation. The frequency of the warm and cold spells was then calculated in the base-line period and compared with the observed frequency, which shows good agreement of results. In the second part, the same procedure was done to assess potential future changes in

the characteristics of these extreme temperature spells as a consequence of greenhouse warming. The simulations show that the increase in longer warm spells is particularly evident for Pakistan.

Attendance at the YSC provided me with a great opportunity to interact with other young scientists and leading researchers in the field of climate change. I came to the conference with a background in plant and soil science, in particular, the measurement of terrestrial carbon (C) storage and emissions from different subtropical land uses. The diversity of subjects discussed in the conference was a wonderful introduction to the multi-disciplinary approaches used to address global change and an incredible learning experience. The YSC also gave me the chance to present my own work and interact with other young scientists and senior scientists working in climate change research. During my poster presentation I received valuable feedback and made many new contacts with other young scientists in my field. This has given me a link to an extensive network of global change scientists, who will be at the forefront of their fields in the next few years. Overall, I am extremely grateful to APN for giving me the opportunity to attend the YSC. The experiences that I have taken away from these conferences will be invaluable to my future career in global change science.



Anna Richards

University of Queensland
St. Lucia, Australia

Email: anna.richards@uq.edu.au

Abstract: Soil carbon turnover in native subtropical tree plantations

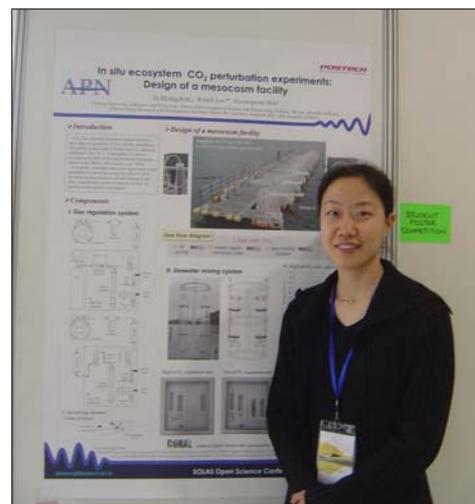
Anna E. Richards, Ram C. Dalal and Susanne Schmidt

Soil organic carbon (SOC) is one of the largest near-surface C stores on earth. Approximately 30% of global SOC is found in subtropical and tropical ecosystems, but it is being rapidly lost from this store due to continuous deforestation activities. Tree plantations are advocated as a potential C sink, however, little is

known about rates of C turnover and sequestration into soil organic matter under subtropical and tropical native tree plantations. We studied changes in SOC in a hoop pine (*Araucaria cunninghamii*) plantation chronosequence established on former rainforest sites in seasonally dry subtropical Australia. Total SOC, $\delta^{13}\text{C}$, and light fraction (LF, $< 1.6 \text{ g cm}^{-3}$) organic C were determined in the chronosequence, secondary rainforest and kikuyu pasture. We calculated loss of rainforest soil C after clearing using an isotope mixing model, and predicted input of hoop pine C into the soil. Total SOC stocks to 1.0 m depth were significantly ($P < 0.01$) higher under rainforest (240.7 t ha^{-1}) and pasture (254.2 t ha^{-1}) compared to hoop pine ($175.9\text{--}211.5 \text{ t ha}^{-1}$). The SOC derived from hoop pine inputs ranged from 32% (25 y plantation) to 61% (63 y plantation) of total soil C in the 0–0.3 m soil interval, but below this depth all C originated from the original rainforest, even after 63 y of plantation growth. These results were compared to simulations from a calibrated version of the Century soil organic matter model. The model accurately predicted whole soil C inputs and losses calculated from $\delta^{13}\text{C}$ measurements. There was also a significant correlation between the Century slow turnover C pool and measured LF C. Both the Century model and LF $\delta^{13}\text{C}$ methods estimated the hoop pine plantation establishment caused an overall loss of 11.2 – 30.0 t C ha^{-1} from the slow turnover C pool (~50% of total slow pool C). These results suggest that subtropical gymnosperm plantations do not rapidly store SOC into long-term storage pools. In addition, the LF C pool could be used to modify current models because it is a useful indicator of land use change effects on SOC storage.

3) The 2007 Surface Ocean Lower Atmosphere Study (SOLAS) Open Science Meeting, 6-9 March 2007, Xiamen, China

The time that I spent at the SOLAS conference in Xiamen was one of the most valuable experiences that I have ever had. It reminded me of the things that I have to learn and keep in mind as a young scientist and a professional expert in the future. Many talks by respectable scientists and the discussions at the conference made me realise that publishing research products is no less important than enjoying the conduct of the research itself. I also learned from the poster session that



sharing ideas, being encouraged or even being severely criticised by others could take me one step forward. For instance, someone asked me such a practical question and others seriously advised me on the way to solve research-related problems. It surprised me that so many people showed interest in my research than what I had expected. It was actually the first time when I started to feel that I am being helpful for other people's study, and I felt proud about it.

I would like to give many thanks to the Asia-Pacific Network for Global Change Research, the organisation that granted me a travel fund, and I also appreciate all participants who took an interest in my research. It was a truly great time.

Ja-Myung Kim

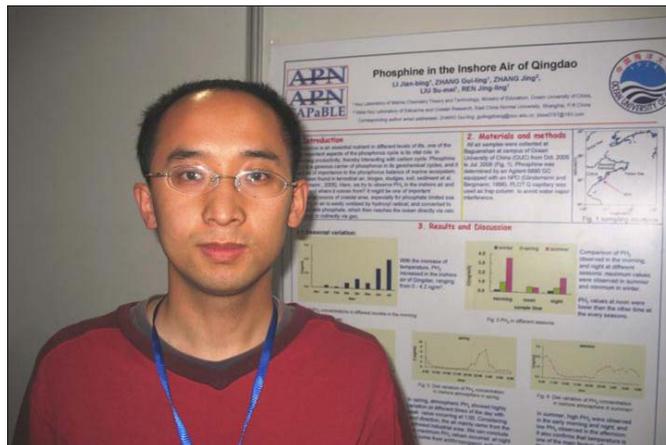
Pohang University of Science and Technology
Gyeongbuk, Republic of Korea
Email: jamyung@postech.ac.kr

Abstract: The effect of seawater CO₂ concentration on growth of a natural phytoplankton assemblage in a controlled mesocosm experiment

Ja-Myung Kim and Kitack Lee

An enclosed experimental system is used as a useful tool for manipulative experiments due to a greater degree of control and replication. A large scale mesocosm study could be one way of approach for merging the advantages of an enclosed incubation study and the benefits of a natural scale experiment. In order to investigate the effect of seawater CO₂ concentration on the growth rate of natural assemblage of mixed phytoplankton, we designed and developed a mesocosm system including nine impermeable enclosures; each has a transparent cap, a CO₂ concentration regulator, and a bubble-mediated seawater mixer. Nine enclosures (3000 L) were set up in the southern coast of Korea (34.6°N and 128.5°W). The CO₂ gas regulation unit, consisting of a mass flow controller and a gas mixing chamber, produced the air at the target CO₂ concentrations of 250, 380, and 750 µatm. The gas with regulated concentration was used in circulating the water and fumigating the head space. Seawater mixers reduced the errors of determining particulate parameters in the enclosure by mixing seawater homogeneously.

I am so thankful that I had the chance to enjoy such an important conference. It offered me the opportunity to communicate with many authorities and young Ph.D students from all over the world. Although I am interested in phosphine, I received plenty of advice from different field experts. At the same time, the plenary talks and posters let me know that the SOLAS field contains so much knowledge, I learned of many ideas and technology related to differential mobility spectrometry (DMS) and halogenated hydrocarbon to enhance my future work. Also, I appreciated the southern Chinese art and culture that was integrated into the atmosphere. In the end, I have encouraged my classmates in our university to apply for SOLAS Summer School with me.



Li Jian-bing

Ocean University of China
Shandong, China
Email: jblee0787@163.com

Abstract: Phosphine in the indoor atmosphere of Qingdao
Li Jian-bing, Zhang Gui-ling, Zhang Jing, Liu Su-mei and Ren Jin-ling

Phosphine, a volatile phosphorus compound, might be of importance to the phosphorus cycles in the atmosphere. For relatively reduced phosphine, hydroxyl free radicals induced by UV from daylight cause its cleavage and oxidation. Phosphine is converted to water soluble phosphate, which reaches the ocean or land via rain or aerosol transport. It has dual effects for negative influences as acid rain and positive effects as a nutrient, especially for oligotrophic water. Phosphine in the inshore air from Qingdao was investigated from October 2005 to July 2006 using a chromatographic method. The results showed that the maximum value occurred in summer and the minimum value occurred in winter due to the balance of production and consumption. In summer, more phosphine is produced mainly by microbes at higher temperature. In winter, consumption of coal does not produce more phosphine because much lower phosphine or even no phosphine was detected in the boiler gas, and low phosphine was produced by microbes due to lower

temperature. Diel variation of phosphine was also observed with the maximum phosphine occurring at night and minimum PH_3 occurring at daytime. During the day, lower phosphine occurred because it was oxidized by hydroxyl radicals. Phosphine in inshore air is easily diffused to the atmosphere above the ocean, and, as such, maybe one of phosphorus sources of the ocean.

Pathways Towards a Sustainable Society with Biodiversity Conservation, 03 February 2007, Kobe, Japan

Being aware that our well-being heavily depends on the services we obtain from the rich biodiversity of the ecosystems (food, timber, fuels, recreation, etc.) and to think of possible ways forward towards achieving a human society with sustainable biodiversity, the APN held the International Seminar “Pathways towards a Sustainable Society with Biodiversity Conservation” on 03 February 2007 at the Hyogo Prefectural Museum of Art, Kobe, Japan. About 160 interested people from the city and region attended this seminar.

Seven experts were invited as speakers, and one of them, Dr. Tohru Nakashizuka, Tohoku University, Japan, emphasised that in order to maintain the ability of the biodiversity and ecosystem in providing services, there is a need to include economic and sociological aspects in the international discussions.

Dr. Patricia Balvanera, Universidad Nacional Autónoma, México, showed in her presentation how diverse changes in biodiversity (e.g. changes in number, composition and spatial distribution of genes and species) threatens human societies by reducing ecosystem’s ability to provide a series of benefits (economic, social, cultural).

A brief overview of China’s five eco-regions was presented by Dr. Keping Ma, Institute of Botany, China. As the country’s economy is rapidly growing, it faces a number of serious environmental problems, likely leading to high rates of extinctions of species.

Dr. Yoshiaki Hashimoto, University of Hyogo and Museum of Nature and Human Activities, Japan, stressed that international cooperation is essential in the common effort to protect biodiversity. Some impressive reports about Japan’s capacity building activities, being conducted in collaboration with partners in Malaysia to train local researchers in developing inventories on diverse organisms and taxonomy, were given.



Plenary session during the seminar

Another expert, from Kobe University, Japan, Dr. Yoshiaki Takeda, reported about the general decreasing trend of species diversity in Hyogo Prefecture's forest. He noted that in sites gently maintained by man, as it used to happen in the traditional Japanese rural landscape of "Satoyama", the number of species has been increasing.

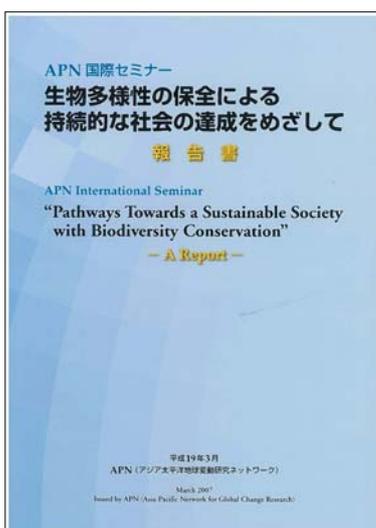


Dr. Takeda responding to a question from the audience

In his presentation, Dr. Channa Bambaradeniya, Asia Regional Species Conservation Programme of The World Conservation Union (IUCN), Sri Lanka, underscored the importance of the traditional landscapes of Sri Lanka in sustaining the island's rich biological heritage.

Mr. Hiromune Mitsuhashi, Museum of Nature and Human Activities, Japan, finally presented on the significance of systematic compilation, accumulation, circulation and utilisation of properly gathered information for biodiversity. Mr. Mitsuhashi also stressed the importance of local volunteers in scientific tasks like collecting data.

On the last part of the seminar, Dr. Hiroshi Ikeda, University of Hyogo and Hyogo Prefectural Homeland for the Oriental White Stork, moderated a panel discussion with previous presenters. Partly responding to questions from the audience, vivid discussions transpired.



Published report of the international seminar

The key messages that came out of the panel discussion were: 1) students require interdisciplinary training to understand the linkages between ecology and biodiversity, and sustainable society and human dimensions of environmental problems; 2) there is a need to promote awareness on the benefits we obtain from biodiversity on one hand and the immense cost associated with biodiversity loss on the other hand; 3) to harmonise efforts of conserving traditional landscapes and sustainable society, not only relationship between man and nature must be enhanced,

but between people themselves as well; and 4) scientists should continually use scientific knowledge to promote education and raise awareness on biodiversity related concerns.

While it is possible that biodiversity loss and alteration spread through a chain of economic and ecological reactions from region to region and that this constitutes a global concern, Dr. Ikeda encouraged the participants to not only *think globally, act locally*, but also to *think and act locally in a global context!* The integrated efforts of social and natural scientists, policy-makers and the general public is needed to conserve biodiversity in a sustainable society.

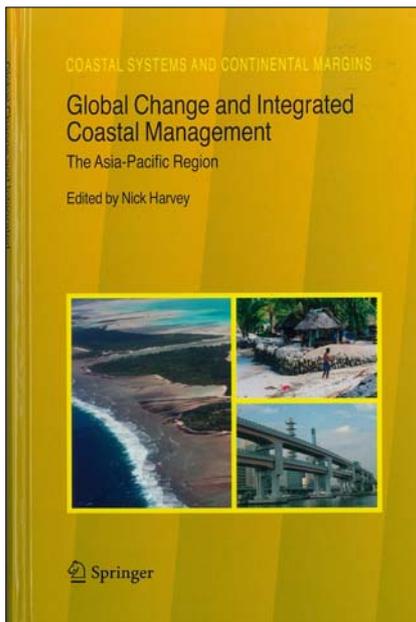
The APN wishes to thank the International Network for DIVERSITAS in Western Pacific and Asia (DIWPA) and the Hyogo Prefectural Government for co-organising the Seminar.

COMMUNICATIONS AND PUBLICATIONS

Communications and information dissemination is important to the APN in order to help achieve its goal of ***providing scientific input to policy decision-making and scientific knowledge to the public***. In its efforts to realise this goal, the APN produces publications (such as annual reports, posters, syntheses and project reports) and participates in relevant global change events. The APN website (www.apn-gcr.org) is also a useful communication tool to disseminate information about the APN's scientific and capacity building activities, funded projects, recent and past publications, and links to other members of the global change community.

Global Change and Integrated Coastal Management: The Asia Pacific Region (N. Harvey, ed.)

Published by Springer



This book is one outcome of the APN synthesis on Global Change Coastal Zone Management and focusses on the potential impacts of global change on coastal environments in the Asia-Pacific region. The region is significant because phenomena such as the Asian Monsoon and the El Niño-Southern Oscillation (ENSO) phenomena affect the world climate; it has diverse marine and terrestrial ecosystems, including the world largest areas of coral reefs and mangroves; it has almost two-thirds of the world's total human population; and its economic growth rate is the highest of any region in

the world. The book identifies important global change issues which will be relevant for the future management of coastal environments in the Asia-Pacific region. The most important of these is global warming and accelerated sea-level rise. The potential impacts from this are compounded by current issues such as unsustainable use of coastal resources; coastal impacts from poor catchment management; population increase and urbanisation pressure; coastal resource and development pressure on rural coasts. The book addresses methods for tackling these issues such as 'integrated coastal management' and the need to recognise the diversity of coastal management

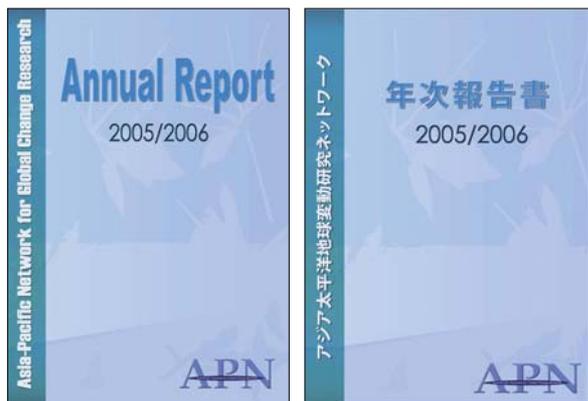
practices in the Asia-Pacific region. The book was written by international coastal experts from the region who have identified key directions for future global change research that will be of relevance for coastal management in the Asia-Pacific region.

7th International Conference on the Environmental Management of Enclosed Coastal Seas (EMECS); Asia-Pacific Coasts Session - Quality Status of the Asia-Pacific Coasts: Conference Report

The conference report presents the outcomes of the joint APN and the International EMECS Center session on Asia-Pacific Coasts at the 7th EMECS Conference in Caen, France. The session focussed on coastal vulnerability and risk management concerning storm surges and tsunamis, and also provided a venue for the introduction of the APN book *Global Change Impacts on Coastal Zone Management in the Asia Pacific*, as well as the EMECS book *Asia-Pacific Coasts and Their Management: States of Environment*.



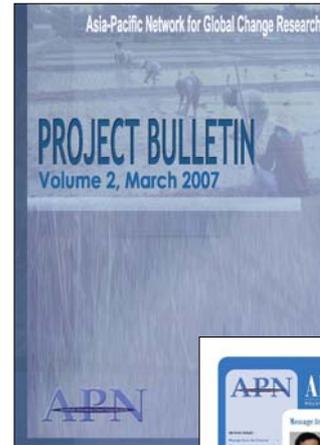
Annual Report 2005/2006 (in English and Japanese)



The APN's Annual Report presents a summary of its efforts at promoting global change research, particularly highlighting the results and outputs of its completed projects conducted under ARCP and CAPaBLE, publications produced by APN, and other activities. For the year 2005/2006, the APN produced its annual report in both English and Japanese.

Project Bulletin, Volume 2

The Project Bulletin contains the abstracts of research and capacity building projects funded by APN under the ARCP and the CAPaBLE Programme. Contact information of the project leaders is also included for those interested in learning more about the funded projects.



APN Newsletter

The APN publishes a quarterly newsletter which features news from the Secretariat, APN-supported projects, regional news, people in the APN and a calendar of events, which highlights particular events supported by the APN. In order to reduce the environmental and economical burden, it was decided to produce the newsletter in electronic format only. All issues of the APN newsletter are available for download in PDF format in the "products" section on the APN website.



Posters

The APN produced three posters in its continued effort to promote its activities not only to the policy-making and scientific communities, but also to the general public. These are the APN general poster, CAPaBLE Phase 2 poster, and a "Partnerships" poster.

APN Asia-Pacific Network for Global Change Research

The APN is an inter-governmental network fostering global change research and links between science and policy-making in the Asia-Pacific region.

Mission
The mission of the APN is to enable investigation of change in the Earth's life support systems as it occurs in the Asia-Pacific region to:

1. Identify, explain and predict changes in the context of both natural and anthropogenic forcing;
2. Assess potential regional and global vulnerability of natural and human systems; and
3. Contribute, from the science perspective, to the development of policy options for appropriate responses to global change that will also contribute to sustainable development.

Main Activities

- Annual Regional Call for Proposals - supporting regional global change research
- CAPaBLE Programme - enhancing scientific capacity in developing countries to improve decision-making in focus areas of global change and sustainable development.

For more information, visit: www.apn-gcr.org

APN CAPaBLE

MAKING A DIFFERENCE

Scientific Capacity Building/Enhancement for Sustainable Development in Developing Countries (CAPaBLE)

What is the aim of CAPaBLE?

PHASE II 2006-2008: Water and Food Security

enhancing scientific capacity in developing countries to improve their decision-making in the target areas related to water and food security that are directly linked to sustainable development

How does CAPaBLE achieve its objectives?

Comprehensive Research Project

Improving Policy Responses to Interaction between Global Environmental Change and Food Security across the Indo-Gangetic Plain (IGP)

Capacity Building

National Climate Change Public Awareness and Outreach in Sri Lanka

Training Seminars on Methodological Issues Related to the Human Dimension of Global Environmental Change

For more information, please visit: www.apn-gcr.org

Asia-Pacific Network for Global Change Research (APN)

Strengthening APN PARTNERSHIPS in the global change community

A key goal of the APN is to strengthen cooperative relations amongst the global change research community.

AN investment in ESSP and GC research projects

ESSP Projects: 20%

GC Research Projects: 20%

Others: 60%

The APN works closely with the 4 global change programmes under the Earth System Science Partnership

What projects has the APN funded?

ESSP Projects

- ESSP One Young Scientists' Conference and Open Science Conference
- Global Water System Interactions in the Asian Region (Geo-Climate and Ecosystems) - 2nd ESSP Asia Network Meeting (ASNP)
- Scaling Up Research on SA: APN Results for Designing Future Research Agenda and Capacity Building Requirements (MARC)
- Improving Policy Responses to Interactions between Global Environmental Change and Food Security Across the IGP (SECAP)

Global Change Collaborative Projects

- Integrational Operations of Global Environmental Change: Water, Health and Environment (HEP)
- Integrated Vulnerability Assessment of Coastal Areas in the Southeast Asia and East Asian Region (EGCD)
- Developing an Integrated Framework for Science-Policy Interactions towards Effective Management of Coastal Systems in South Asia (EGCD)
- Strengthening Scientific Capacity in the Surface Ocean Lower Atmosphere Study: The 2007 SOULS Open Science Meeting in Xiamen, China (EGCD)
- Integrational Dimensions of Global Environmental Change Synthesis Conference (EGCD)

For more information, visit: www.apn-gcr.org

National and International Fora

The APN attends national and international meetings, conferences and workshops, relating to global change, to disseminate information about its activities as well as to learn more about what is going on in the global change community.

In 2006/07, APN members/Secretariat staff attended/made presentations at²:

- MAIRS Workshop on Science Framework. China
- United Nations Commission on Sustainable Development: 14th UNCED/Partnership Fair. USA
- EMECS 7 Conference (Asia Pacific Session on Coastal Zone Management). France
- 24th Session of the Subsidiary Body for Scientific and Technological Advice (SBSTA 24) of the UNFCCC. Germany

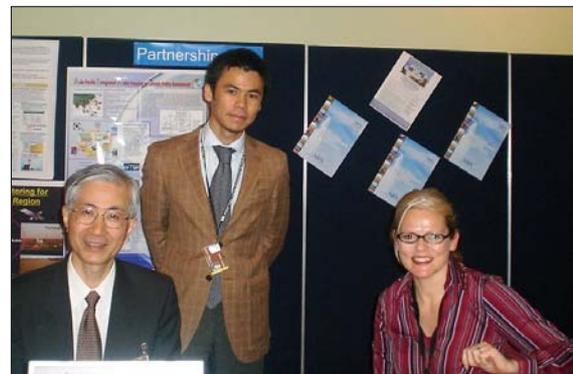


*SBSTA 24,
Germany*



*1st Int'l
Symposium
for Climate
Change
Adaptation,
Republic of
Korea*

- 1st International Symposium for Climate Change Adaptation. Republic of Korea
- 14th Environment Congress for Asia and the Pacific (ECO Asia). Japan
- Coastal Zones of the Asia-Pacific (CZAP) Conference. Indonesia
- 16th Asia-Pacific Seminar on Climate Change. Indonesia
- 15th North Pacific Marine Science Organization (PICES) Annual Meeting. Japan
- **APN/IHDP 5th International Human Dimensions Workshop. Thailand**
- International Group of Funding Agencies for Global Change Research (IGFA) Annual Meeting. Canada
- **2nd International Young Scientists' Conference. China**
- **ESSP Open Science Conference. China**
- 3rd Plenary Session of Group on Earth Observations (GEO III). Germany
- **2nd Asian Water Cycle Symposium. Japan**
- Global Earth Observation System of Systems (GEOSS) Symposium on Integrated Observation for Sustainable Development in the Asia-Pacific Region. Japan



14th UNCED, USA

² Events in boldface are also APN-funded project activities.

PEOPLE IN THE APN

The APN is made up of dedicated experts who play an active role in promoting the APN programme and its activities in their countries. Each member country appoints one national Focal Point (nFP), who sets policy for programmes, finances and other APN activities, and one Scientific Planning Group (SPG) member, who recommends science themes and activities for the IGM to consider for support.

The members listed below are current, at the time of publication, March 2008.

AUSTRALIA

Michael STODDART (nFP), Australian Antarctic Division

David WALLAND (SPG), Bureau of Meteorology

BANGLADESH

Md. Nazrul Islam KHAN (nFP), Ministry of Environment and Forest

Giashuddin MIAH (SPG), Bangabandhu Sheikh Mujibur Rahman Agricultural University

CAMBODIA

Sundara SEM (nFP), Ministry of Environment

Khieu HOURT (SPG), Ministry of Agriculture, Forestry and Fisheries

CHINA

Xuedu LU (nFP), Ministry of Science and Technology

Wenjie DONG (SPG), China Meteorological Administration

FIJI

Epeli NASOME (SPG), Ministry of Tourism and Environment

INDIA

Subodh SHARMA (nFP), Ministry of Environment and Forests

Ashesh Prosad MITRA (SPG), National Physical Laboratory (*Deceased*)

INDONESIA

Liana BRATASIDA (nFP), Ministry of Environment
Erna Sri ADININGSIH (SPG), Aerospace Analysis
and Information Center National Institute of
Aeronautics and Space (LAPAN)

JAPAN

Naoya TSUKAMOTO (nFP), Ministry of the
Environment
Nobuo MIMURA (SPG), Ibaraki University

LAO PEOPLE'S DEMOCRATIC REPUBLIC

Phonechaleune NONTAXAY (nFP), Science
Technology and Environment Agency
Chanhanet BOUALAPHA (SPG), Water Resources
and Environment Administration

MALAYSIA

Yap Kok SENG (nFP), Malaysian Meteorological
Service
Subramaniam MOTEN (SPG), Malaysian
Meteorological Department

MONGOLIA

Bayarbat DASHZEVEG (nFP), Ministry of Nature and
Environment of Mongolia
Tsogtbaatar JAMSRAN (SPG), Mongolian Academy
of Sciences

NEPAL

Meena KHANAL (nFP), Ministry of Environment,
Science and Technology
Madan Lall SHRESTHA (SPG), Nepal Academy of
Science and Technology

NEW ZEALAND

W. Andrew MATTHEWS (nFP) (SPG), New Zealand
National Commission for UNESCO

PAKISTAN

Muhammad Tanvir BUTT (nFP), Ministry of
Environment
Amir MUHAMMED (SPG), National University of
Computer and Emerging Sciences

PHILIPPINES

Samuel PEÑAFIEL (nFP), Department of Environment and Natural Resources
Marcial C. AMARO, Jr. (SPG), Ecosystems Research and Development Bureau

REPUBLIC OF KOREA

Jung Kyun NA (nFP), Ministry of Environment
Kwang-Woo CHO (SPG), Korea Environment Institute

RUSSIAN FEDERATION

Alexander STERIN (SPG), Russian Research Institute for Hydrometeorological Information - World Data Center

SRI LANKA

M.A.R.D. JAYATILAKE (nFP), Ministry of Environment
G.H.P. DHARMARATNA (SPG), Department of Meteorology

THAILAND

Saksit TRIDECH (nFP), Ministry of Natural Resources and Environment
Jariya BOONJAWAT (SPG), Chulalongkorn University

UNITED STATES OF AMERICA

Louis BROWN (nFP), U.S. Climate Change Science Program; National Science Foundation
Luis M. TUPAS (SPG), US Department of Agriculture

VIET NAM

Xuan Bao Tam NGUYEN (nFP), Ministry of Natural Resources and Environment
Nga MAI NGOC (SPG), Center for Support of Social Development Programmes

INVITED EXPERTS TO THE SPG

Roland FUCHS, East-West Center (formerly with the International START Secretariat)
Chao Han LIU, SARCS
Kanayathu KOSHY, START Oceania
Congbin FU, TEACOM
Chhemendra SHARMA, National Physical Laboratory

APN Secretariat

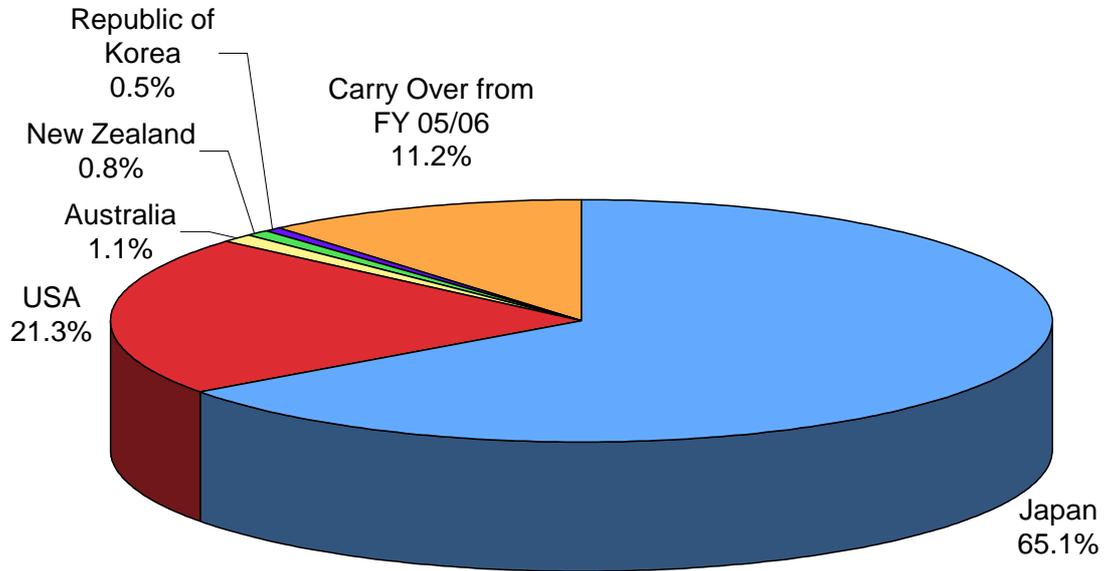
The Secretariat is located in Kobe, Japan, under the support of Hyogo Prefecture, with a mandate to carry out the day-to-day operations of the network; provide secretariat support to the organs of the APN; and implement Inter-Governmental Meeting decisions.

The Secretariat listed below is current, at the time of publication, March 2008.

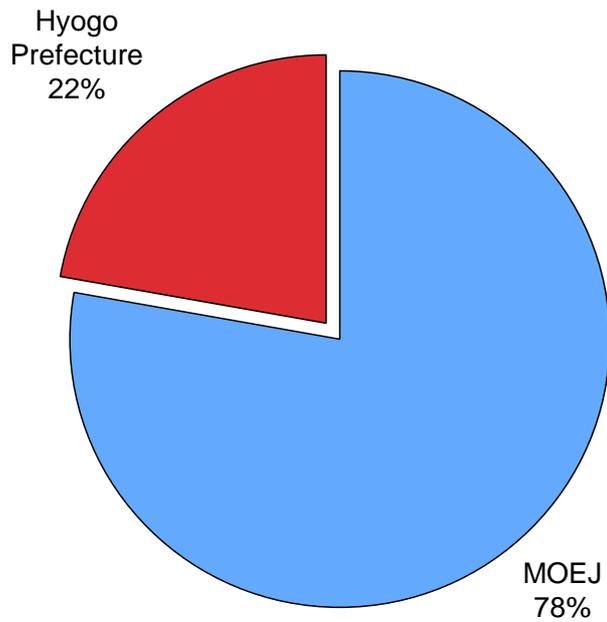


APN Secretariat
5th Floor, IHD Centre Building
1-5-1 Wakinohama Kaigan Dori
Chuo-ku, Kobe 651-0073, JAPAN
Tel: (+81) 078-230-8017 | Fax: (+81) 078-230-8018
Email: info@apn-gcr.org | Website: www.apn-gcr.org

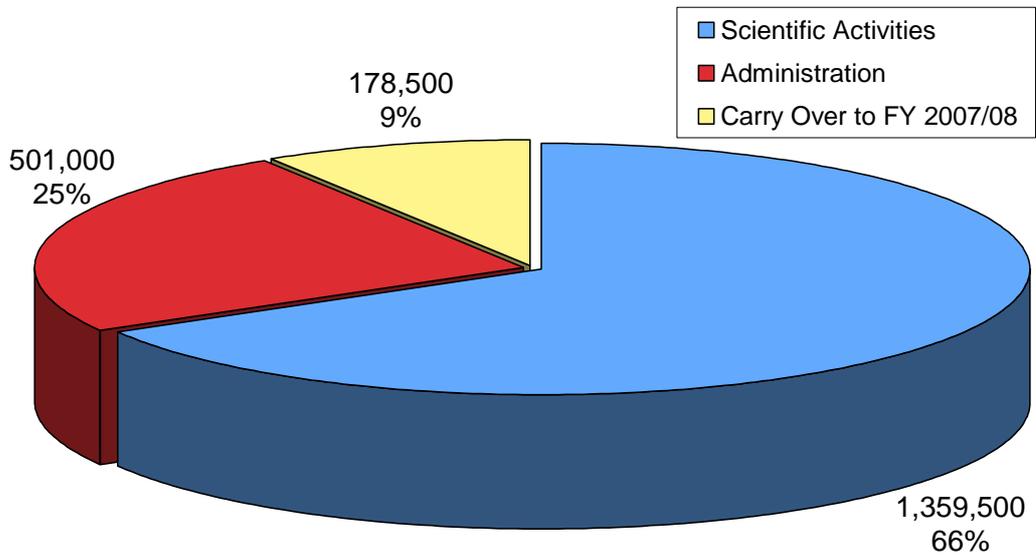
APN Member Contributions 2006/2007



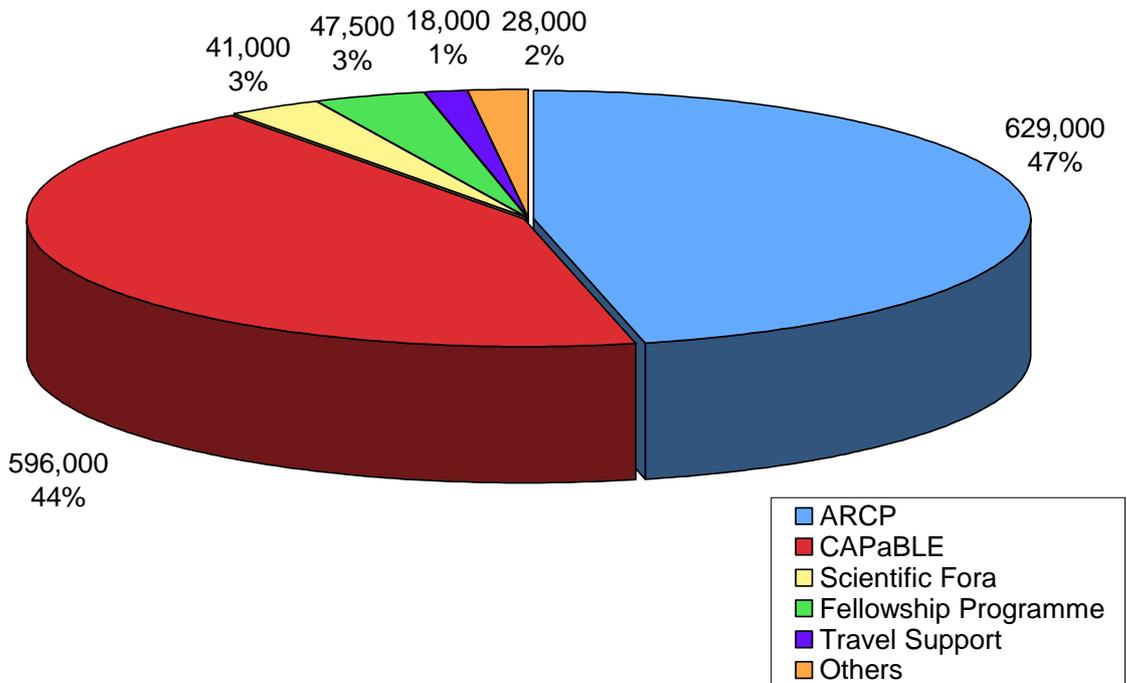
Breakdown Contributions from Japan



Expenditures in FY 2006/2007



Breakdown of Expenditures for Scientific Activities



MEMBER COUNTRIES AND SPONSORS

APN Member Countries

The APN's membership has grown from 12 countries in 1996 to the current 21 member countries:

Australia, Bangladesh, Cambodia, China, Fiji, India, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Mongolia, Nepal, New Zealand, Pakistan, Philippines, Republic of Korea, Russian Federation, Sri Lanka, Thailand, United States of America, and Viet Nam.

APN Sponsors



Ministry of Environment
Republic of Korea



National Science Foundation
United States of America



United States of America

The above sponsors provide direct funding for the APN that is complimented by in-kind support from APN members, such as hosting workshops and seminars and the sharing of scientific and management expertise.

ACRONYMS

APN	Asia-Pacific Network for Global Change Research
ARCP	Annual Regional Call for Proposals
ASEAN	Association of Southeast Asian Nations
CAPaBLE	Scientific Capacity Building and Enhancement for Sustainable Development in Developing Countries
CCCS	Center for Climate Change Studies
CLIVAR	Climate Variability and Predictability
CMAQ	Community Multi-Scale Air Quality Model
CZAP	Coastal Zones of the Asia-Pacific
DIVERSITAS	International Programme of Biodiversity Science
DIWPA	DIVERSITAS in Western Pacific and Asia
DMS	differential mobility spectrometry
EANET	Acid Deposition Monitoring Network in East Asia
ECO Asia	Environmental Congress for Asia and the Pacific
EMECS	Environmental Management of Enclosed Coastal Seas
ENSO	El Niño-Southern Oscillation
ESG	Earth System Governance
ESSP	Earth System Science Partnership
EWC	East-West Center
FRCGC	Frontier Research Center for Global Change
GCM	Global Climate Model
GCP	Global Carbon Project
GEO	Group on Earth Observations
GEOSS	Global Earth Observation System of Systems
GHG	greenhouse gas
GIS	Geographic Information System
GMS	Greater Mekong Sub-region
GWSP	Global Water System Project
HEM	Human Ecosystem Model
IDGEC	Institutional Dimensions of Global Environmental Change
IGBP	International Geosphere-Biosphere Programme
IGFA	International Group of Funding Agencies for Global Change Research
IHDP	International Human Dimensions Programme on Global Environmental Change
IHDW	International Human Dimensions Workshop
IPCC	Intergovernmental Panel on Climate Change
IUCN	The World Conservation Union
MAIRS	Monsoon Asia Integrated Regional Study
MEEP	Mobile Environmental Education Program
MI	Mekong Institute
MOEJ	Ministry of the Environment, Japan
MRBSR	Mekong River Basin Sub-Region

nFP	national Focal Point
NGO	Non-Government Organisation
NIWA	New Zealand National Institute of Water and Atmospheric Research
NOAA	U.S. National Oceanic and Atmospheric Administration
OSC	Open Science Conference
PABITRA	Pacific-Asia-Biodiversity Transect Network
PICES	North Pacific Marine Science Organization
PNRC	Palau Natural Resources Council
PSA	Pacific Science Association
RCM	Regional Climate Model
REAS	Regional Emission Inventory in Asia
SARAP	South Asia Rapid Assessment Project
SARCS	Southeast Asia Regional Committee for START
SASCOM	South Asian START Committee
SBSTA	Subsidiary Body for Scientific and Technological Advice
SOC	Soil Organic Carbon
SOLAS	Surface Ocean Lower Atmosphere Study
SPG	Scientific Planning Group
START	global change System for Analysis, Research and Training
TAR	Third Assessment Report
TEACOM	Temperate East Asia Committee for START
UNCSD	United Nations Commission on Sustainable Development
UNFCCC	United Nations Framework Convention on Climate Change
USER	Unit for Social Environmental Research
USP	University of the South Pacific
WCRP	World Climate Research Programme
YSC	Young Scientists' Global Change Conference

Should the contact information listed in this publication have changed, please kindly fill out the form below and return it by fax or email to:

The APN Secretariat
 5th Floor, IHD Centre Building
 1-5-1 Wakinohama Kaigan Dori,
 Chuo-ku, Kobe 651-0073, JAPAN
 Tel: (+81) 078-230-8017, Fax: (+81) 078-230-8018
 Email: info@apn-gcr.org

Contact Details	
<i>Full Name</i> (write LAST NAME in CAPS)	<i>Title</i> (select as appropriate) <input type="checkbox"/> Dr. <input type="checkbox"/> Prof. <input type="checkbox"/> Mr. <input type="checkbox"/> Mrs. <input type="checkbox"/> Ms. <input type="checkbox"/> Other _____
<i>Qualifications/Specialty</i>	
<i>Specific areas of interest relating to Global Environmental Change</i>	
<i>Name of Organisation</i>	<i>Designation/Position</i>
<i>Type of Organisation:</i> <input type="checkbox"/> Government Agencies <input type="checkbox"/> Educational Institutions <input type="checkbox"/> NGOs/NPOs <input type="checkbox"/> Private Foundations <input type="checkbox"/> Professional Societies <input type="checkbox"/> Others	
<i>Business Address</i>	<i>Postal Code</i>
	<i>Country</i> (in CAPS)
<i>Telephone</i>	<i>Facsimile</i>
<i>Email</i>	<i>Website</i>

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http://www.apn-gcr.org/en/downloads/blankform_apndirectory.pdf.



The APN Secretariat
5th Floor, IHD Centre Building
1-5-1 Wakinohama Kaigan Dori
Chuo-ku, Kobe 651-0073, JAPAN
Tel: +81-78-230-8017
Fax: +81-78-230-8018
Email: info@apn-gcr.org
Website: <http://www.apn-gcr.org>