APN NEWSLETTER

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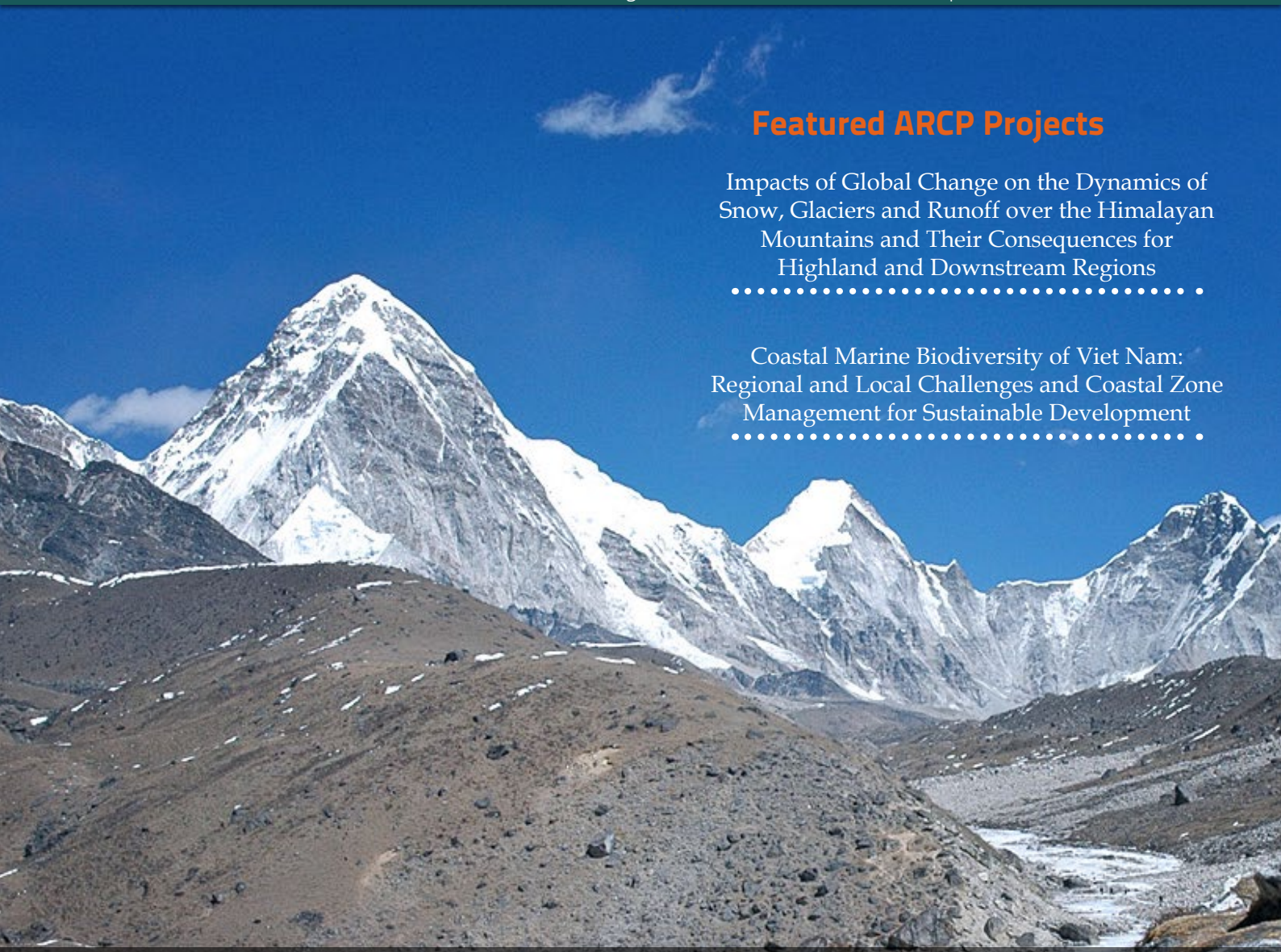

Featured ARCP Projects

In This Issue

Featured CAPaBLE Projects

Photo: Khumbu Glacier Valley (Peter576/Flickr)

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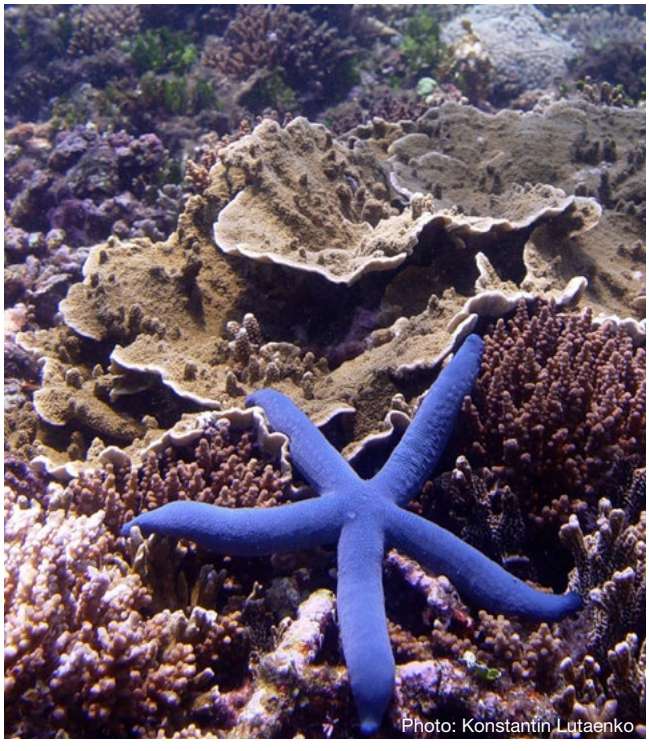

Photo: Konstantin Lutaenko

Message from the Director

Dr. Akio Takemoto
Director, APN Secretariat

It is my pleasure to present you this new issue of APN Newsletter.

The past three months have been very fruitful and productive for APN, as we launched our annual calls under the ARCP and CAPaBLE programmes in June, and a special call for expression of interest for a focused activity, the Low Carbon Initiative (LCI) programme in July. I am happy to report to you that we have received close to 100 summary proposals for ARCP and CAPaBLE combined, and more than 45 expressions of interest for the LCI programme. The Secretariat is collating all submissions to facilitate the review process conducted by APN Scientific Planning Group (SPG) members and external reviewers.

We successfully organized a session at the "Adaptation Futures" Conference co-hosted by the University of Arizona and UNEP's Programme of Research on Climate Change Vulnerability, Impacts and Adaptation (PROVIA), in Arizona USA on 31 May. By introducing best practice examples of APN activities and partner initiatives, the session highlighted the importance of partnership and networking to facilitate the development and implementation of local, national and regional adaptation strategies. We then brought the messages generated from the session, in the form of a policy brief, to the Rio+20 Conference in June, making them available to a broader audience in the science and policy-making community.

The APN partnered with START and successfully organized a Science-Policy Dialogue that brought together 90 scientists and decision-makers from Southeast Asia from 19 to 21 July in Bangkok, Thailand, as an effort to strengthen the interface between scientists and policy-makers to address challenges of global environmental change, which are increasingly relevant in the policy context for a fast growing region that is particularly vulnerable to global change.

Adding to networking with global change research community, we have been actively expanding interactions with other international and regional bodies including UNFCCC, UNCSD, UN-CECAR, LoCARNet, , ADB, APAN, etc, through various meetings and workshops, in order to meet policy needs of member countries.

To gather input for APN's framework activities on ecosystems services and climate adaptation, the Secretariat organized and facilitated two important workshops in Bangkok, Thailand and Kobe, Japan, respectively. Experts invited to these workshops have provided highly valuable suggestions and recommendations for the APN to determine its role in supporting these two priorities of our activities.

Recently we welcomed new members from Japan, Lao People's Democratic Republic, Sri Lanka and the USA, many of whom have already started working closely with the Secretariat in their respective capacities as national Focal Points (nFPs) or SPG members. Taking this opportunity I would like to express my sincere gratitude to the outgoing members, for their hard work and dedication to promote the APN agendas in their countries.

In this issue, we feature a number of recently completed research and capacity building projects which has produced substantial output and exerted great impact to the global change research community in the region. I give my special thanks to the project leaders and collaborators, whose work has contributed greatly to the attainment of APN's strategic goals in its Third Strategic Period (2010–2015).

Finally I would like to thank all contributors to this issue, including APN members, project leaders and collaborators, as well as key partners in the global change community. At the same time, to those new members and potential partners of the APN, I look forward to working with you closely in the future to promote global change research in the region.

APN Collaborates with START for Closer Science-Policy Links in Southeast Asia

21 July 2012, Bangkok, Thailand — As part of its effort to address the strategic goal of strengthening appropriate interactions among scientists and policy-makers, and to provide scientific input to decision-making and scientific knowledge to the public, the APN joined forces with START International in successfully holding a Science-Policy Dialogue focusing on Southeast Asia. Hosted by the Southeast Asia START Regional Center, the three-day Dialogue was composed of thematic discussion and conversation which created a platform for promoting informed decision-making on actions to reduce vulnerability to global environmental change and promote adaptation strategies.

Ninety participants, including policy-makers from APN member countries in Southeast Asia, leading scientists and professionals in the region in the fields of climate adaptation, disaster risk management and environmental management, as well as representatives from partner organizations shared knowledge on recent advances in global change science ranging from disaster risk management through vulnerability and resilience to climate adaptation and mitigation, and introduced successful application of those advances within the policy arena.

Day 1

The Dialogue was opened on 19 July 2012, with welcome remarks by Dr. Akio Takemoto, APN Secretariat Director, and Dr. Hassan Virji, Executive Director of START. Both emphasized the need to foster closer science-policy conversation towards reducing vulnerability and increasing resilience in a development context.

Mr. Sundara Sem, Chair, APN Steering Committee

This was followed by a talk by Prof. Roland Fuchs of the East-West Center in Hawaii, who highlighted the necessity and objectives of the Dialogue, as emerging challenges and prevailing obstacles for science-policy interface increasingly add to the inherent weakness that had created the divide. He stressed the importance of training as an approach to narrowing this gap and improving the interface.

Dr. Nares Damrongchai, senior director at the National Science Technology and Innovation Policy Office, Thailand, presented on the policy context of environmental challenges in Southeast Asia, and underlined the role of cities as agents for change, as they have stronger influence about the decisions policy-makers take on environment-related policies.

Science-Policy Dialogue on Challenges of Global Environmental Change in Southeast Asia

Prof. Graeme Pearman of Monash University in his presentation shed light on the need for greater risk assessments and the probabilities of change, since decision-makers face realities such as not having all the information they need to shape policies. He further drew attention to a holistic approach towards disaster risk management in the context of competing sectoral interest and multiple community goals.

Dr. Bach Tan Sinh from Ministry of Science and Technology, Viet Nam introduced the findings of the IPCC Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX), especially its implications for Southeast Asia, stressing the need for tailored risk management strategies to meet local needs.

Prof. Wei-Sen Li of Taiwan's NDRC made the case for how the private sector could be involved in disaster preparedness to increase resilience at the local level by introducing the works undertaken by Asia Pacific Economic Cooperation (APEC) and Emergency Preparedness Working Group (EPWG).

In the facilitated discussion session that followed, participants contributed actively to topics such as how to differentiate and provide targeted scientific information for long-term solutions versus that for short-term actions; how to deal with uncertainties in policy-making and planning; possible solutions for addressing communication gaps caused by governmental official changes; the importance of cross ministerial engagement in addressing global change challenges; best practices of utilizing social media for advocacy and awareness raising; focus on community needs by both scientific and policy communities, among others.

Dr. Anond Snidvongs of SEA-START presented on urban vulnerability and risk management in Thailand through case studies of floods that swept through the country in 2011. By looking at the human factors that contributed to the disasters he drew attention to the importance of effective communication of risk management policies down to the local level.

Dr. Wen-Sen Li in his second talk, "How Disaster Science Information is Communicated to Public and Policy Audiences in Taiwan", explored the need for an integrated information system in the face of extreme climate events, where the private sector can play an important role. An example given was how his organization worked with a convenient store chain in Taiwan to disseminate information on disaster warning and preparedness.

This was followed by a second discussion session of the day, with focus on urban policy challenges for Indonesia, Malaysia, Cambodia and the Philippines. APN national Focal Points from these countries shared major challenges facing urban planners as urbanization progresses rapidly in these fast-developing economies. The need for integrating mitigation and adaptation was stressed, and the importance of developing strategies to deal with uncertainty was reiterated. Risk sharing through a market mechanism was seen as an option, while more research and development were deem necessary to better understand the risks and vulnerabilities. Participants also called for continued capacity building efforts to

maintain and increase institutional strength to deal with emergencies.

Day 2

Dr. Hassan Virji opened the discussions noting that adaptation practice to deal with global environmental change must be viewed as a dynamic social process, and more players, especially from the private sector and engineers, should be brought into the conversation.

Dr. Louis Lebel of Chiang Mai University Governance of presented on "Governance of Adaptation and Building Social-Ecological Resilience in the Mekong Region". He indicated that adaptation is as much a political issue as a technical issue, and explained why the region needs polycentric forms of governance and effective coordination structures to bridge knowledge gaps.

Dr. Luong Quong Huy of Ministry of Natural Resources and Environment, Viet Nam in his presentation titled "Adaptation Challenges to Sustain Ecosystem Services," pointed out that while a myriad of policy options exist to address environmental concerns, development and poverty reduction are taken as a priority. Therefore, appropriate links should be developed between adaptation and development.

Mr. Suppakorn Chinvanno of SEA START Regional Center looked at policy planning from the community perspective, whereby he argued that a paradigm shift must be made in terms of helping local communities improve climate resilience. He drew attention to the need for capacity building at the grassroots level, noting that solutions must be community-specific and hence a "social" dialogue is required that goes beyond the science and policy sectors.

Ms. Liana Bratasida, member of the Expert Team to the Ministry of Environment, Indonesia, noted in her talk that climate change adaptation has become an important pillar in the country's national planning agenda, with increasing coordination among different levels of government. She said that as Indonesia is finalizing its National Adaptation Programmes of Action (NAPA), there is a general need for technical guidance for NAPA implementation.

The facilitated discussion that followed focused on adaptation and its links with ecosystem services and management. Participants emphasize the need to strategically engage the private sector to address adaptation in a multi-stakeholder approach. Regarding ecosystem services, the important role of local knowledge was noted, which can be combined with scientific knowledge for better-informed policies. Other aspects where scientists and policy-makers can work closer in, such as managing trade-offs on

adaptation and ecosystems services, changing production and consumption patterns and shaping the behaviour and attitudes of the general public, were raised and discussed.

The ensuing presentations centred on capacity building for local communities, researchers and policy makers. Prof. Juan Pulhin of the University of the Philippines, Los Baños noted that local ownership, awareness and engagement are important for building robust policy options, and as a result, local and national champions are needed to serve as catalysts to achieve this goal.

Prof. Joy J. Pereira, Institute for Environment and Development at the Universiti Kebangsaan Malaysia presented on capacity strengthening for policy research on mainstreaming adaptation to climate change in agriculture and water sectors in the region, noting the need to establish linkage between different development agendas and for a stronger mechanism to translate science into policy. She introduced a "starting point approach" which shape policies by making capacity-building decisions through looking at adaptation capacities of local authorities at the current time.

The second facilitated discussion for the day probed into related adaptation challenges with focus on water resources and agriculture sectors in Viet Nam, Philippines, Lao PDR and Thailand. Participants expressed the need to draw lessons from past climate extreme events, including the floods in Thailand in 2011. The importance of creating balance among the need for food security was also stressed, as policy makers must decide on trade-offs between using resources for agriculture, energy and industry. Participants further noted that engaging local authorities in adaptation planning is important for many countries because of decentralization.

Day 3

The day started with a summary of the discussions so far by the rapporteur, followed by discussions on the progress made and way forward to address challenges of global environment change. Views were expressed regarding the scientific and institutional aspects of climate change adaption and disaster risk management, ranging from technical issues such as developing action-oriented information regarding data gathering, to others including identifying best adaptation actions taking into account governance structures. A key message emerged from the discussion clearly showed the need to actively maintain science-policy linkage, taking local input into consideration.

The final discussion session was dedicated to the future role of APN in supporting countries in the region to address challenges of global environmental change, which generated a range of constructive and highly valuable suggestions and recommendations, including expanding existing partnerships and establishing new ones; engaging more experts and experience from other fields of research and development, and from countries outside the Asia-Pacific region; and continually building trust among the multi-stakeholder community, etc.

Interweaved into the event agenda were three gaming sessions designed by colleagues at Red Cross-Red Crescent Climate Centre with the aim of accelerating learning, fostering dialogue, and promoting decision-making regarding climate risk management.

More information about the workshop, including presentations and daily reports, are available at http://www.start.or.th/.

Background information about the participatory games can be found at http://www.bu.edu/pardee/research/task-force-meeting-and-gaming-session-games-for-a-new-climate/.

Based on the report prepared by SEA START RC

APN Session at Adaptation Futures Conference Underscores Climate Adaptation Partnerships for Sustainable Development

31 May 2012, Tucson, Arizona, USA — In the lead-up to the Rio+20 conference, the Asia-Pacific Network for Global Change (APN) organized a session at the Climate "Adaptation Futures" Conference held on 29–31 May 2012 at The University of Arizona, USA. The session focused on the importance of partnerships and networking to facilitate the adoption of local, national and regional adaptation strategies.

Invited speakers from Bangladesh University of Engineering and Technology (Bangladesh), Ibaraki University (Japan), Institute for Global Environment Strategy (Japan), National University of Mongolia (Mongolia), Sustainable Development Policy Institute (Pakistan), University of the Philippines, Los Baños (the Philippines), and Hanoi University of Science (Viet Nam) shared their views, through a case study approach, on how to enhance adaptation actions in the Asia-Pacific Region.

Building on the presentations and discussions during the session, the APN released a policy brief to summarize key messages and to convey them to the global change research community at the United Nations Conference on Sustainable Development (Rio+20) and beyond. The policy brief can be downloaded from http://www.apn-gcr.org/resources/items/show/1747.

About the "Adaptation Futures" Conference

Co-hosted by the University of Arizona and by UNEP's Programme of Research on Climate Change Vulnerability, Impacts and Adaptation (PROVIA), the Adaptation Futures conference focused on adaptation to climate variability and change. The conference brought together researchers, policy makers and practitioners from developed and developing countries to share insights into the challenges and opportunities that adaptation presents.

It showcased cutting-edge research from around the world, focusing on themes of equity and risk, learning, capacity building, methodology, adaptation finance and investment, and ecosystem based adaptation approaches. It explored practical adaptation policies and approaches, and shared strategies for decision making from the international to the local level.

Publication: Policy Brief on Climate Adaptation Partnerships for Sustainable Development

APN Steering Committee Meets in Special Session in Bangkok, Thailand

18 July 2012, Bangkok, Thailand—With active participation of Steering Committee (SC) members, alternates, donor members, and tremendous dedication from the SC Chair, Mr. Sundara Sem, the APN successfully held a productive Special Steering Committee (SSC) meeting dedicated to planning actions that are committed to the strategic investment of the APN Opportunity Fund (AOF) over a three-year period.

The meeting took place as a follow-up on APN's recent call for suggestions on the allocation of the AOF, both in terms of strategic activities to be funded and the general process and mechanism for appropriating the fund. The call was launched in response to a decision at APN's 17th Inter-Governmental Meeting for the allocation of the AOF.

The SC reaffirmed that the AOF was an important opportunity for the APN to invest in framing its future strategic directions beyond the existing funding mechanisms. Therefore it was suggested that the AOF be used to support new strategic efforts that would enable the APN to grow into a stronger player that promotes global change research in the region. With the above understanding, the SC agreed that many submissions, though highly in line with the themes set out in the APN Third Strategic Plan, addressed specific scientific and capacity building concerns, and were not recommended for AOF funding but to be re-routed to APN's regular programmes of ARCP and CAPaBLE.

Following active discussions, a set of criteria for screening the suggestions submitted were proposed and participants reviewed all submissions using these criteria. Using these criteria, a number of suggested activities were identified to be appropriate for funding under the AOF, pending further development by proponents and relevant actors, taking into account the suggestions and advice provided during the SSC meeting.

Possible activities recommended for further consideration and development are: 1) the involvement of the regional development of Future Earth in the Asia-Pacific region, 2) the development of a professional training package on climate and ecosystems change, adaptation and sustainability science; 3) an open conference for the benefit of APN strategic planning; and 4) a research programme for the assessment of climate change impacts on biodiversity.

Emanated from the discussions was also the opportunity of conducting a scoping exercise with the aim of establishing a long-term fellowship programme under the APN framework to support young scientists. If established, the fellowship programme is expected to benefit more young scientists in the region while raising APN's visibility at the same time.

The SC further considered the appropriate level of contingency fund for the secretariat, and possible activities to assess the gaps in APN Strategic Plan implementation, among other important issues.

The Secretariat would like to express its sincere gratitude to the SC Chair and SSC participants for their valuable contribution and guidance that are crucial for the implementation of follow-up actions to facilitate the planning of strategic investment of the AOF.

APN Welcomes New Members

Please join the APN Secretariat in welcoming our new members:

National Focal Points:

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Likewise, we extend our sincere gratitude and appreciation to the outgoing member representatives who have been very supportive to the APN's activities:

Mr. Yutaka MATSUZAWA (nFP for Japan)
Dr. Bountanh BOUNVILAY (nFP for Lao PDR)
Mr. Oulaphone ONGKEO (SPG Member for Lao PDR)
Mr. G.B. SAMARASINGHE (SPG Member for Sri Lanka)

Message from SPG Member for USA

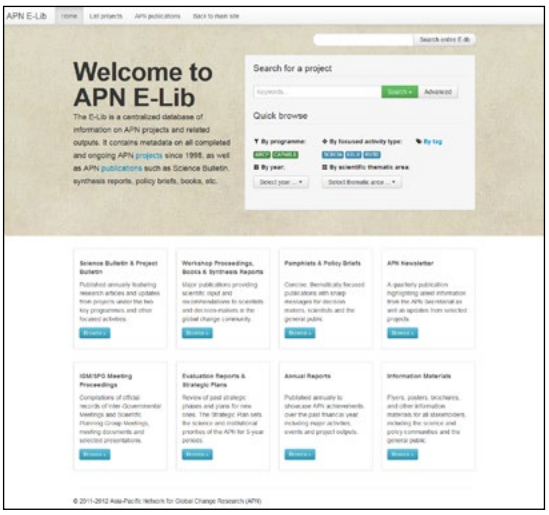
I am delighted to be returning to the APN after a three year hiatus. During that time, the US Global Change Research Program was developing its new strategic plan and the US National Climate Assessment was also underway.

I have been involved in both of these processes and I am happy to report that the new USGCRP strategic plan reflects a stronger commitment to addressing societal needs in addition to making bold advancements in global change science. In addition, the US National Climate Assessment is now designed as a continuous process of review and evaluation rather than a periodic summary and report.

As for myself, I am now the Division Director for Global Climate Change at the USDA National Institute of Food and Agriculture. My division is responsible for the portfolio of climate research, education and extension activities managed through federal investments in academic, public, and private entities addressing climate change issues for agriculture and natural resources.

It is a new and exciting responsibility for me. My return to APN allows me to once again be engaged in an effort to build capacity and advance knowledge of global change science in the Asia-Pacific Region. I am happy to be working once more with the APN Secretariat and my colleagues from the SPG.

APN E-LIB REDESIGNED



We are pleased to announce a redesign of the APN E-Lib, a centralized web-based database of information on APN projects and related outputs. It contains metadata on all completed and ongoing APN projects since 1998, as well as APN publications such as Science Bulletin, synthesis reports, policy briefs, books, etc.

The new interface allows you to browse through APN projects using predefined criteria, while making it easier to search for a specific project using keywords. We hope the E-Lib will be a useful tool for all actors in the global change community, and your suggestions and advice on improving the system is highly appreciated.

Visit E-Lib: http://www.apn-gcr.org/resources/

New Publications

ARCP2010-02CMY-Phua: Integrated Prediction of Dipterocarp Species Distribution in Borneo for Supporting Sustainable Use and Conservation Policy Adaptation
http://www.apn-gcr.org/resources/items/show/1565

ARCP2011-06CMY-Li: Analysis on Urban Land-Use Changes and its Impacts on Food Security in Different Asian Cities of Four Developing Countries Using Modified CA Model
http://www.apn-gcr.org/resources/items/show/1587

ARCP2011-10CMY-Lutaenko: Coastal Marine Biodiversity of Vietnam: Regional and Local Challenges and Coastal Zone Management for Sustainable Development
http://www.apn-gcr.org/resources/items/show/1591

CBA2011-13NSY-Tolentino: Institutionalizing Agroforestry as a Climate Change Adaptation Strategy through Local Capacity and Policy Development in Southeast Asia
http://www.apn-gcr.org/resources/items/show/1691

ARCP2011-22NSG-Liu: Scoping Workshop to Develop Proposal: The Impact of Global Warming Ocean Atmosphere Feedback Strength in the Tropical Indian Ocean
http://www.apn-gcr.org/resources/items/show/1603

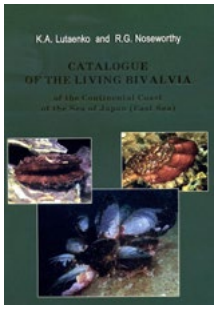
CBA2011-01CMY-Kawai: Capacity Building of Biodiversity Research in the Coastal Zones of the Asia Pacific Region: Phycology Taxonomy Analysis Training Using Genetic Marker
http://www.apn-gcr.org/resources/items/show/1679

CBA2011-03NSY-WCRP: WCRP Open Science Conference: Climate Research in Service to Society
http://www.apn-gcr.org/resources/items/show/1681

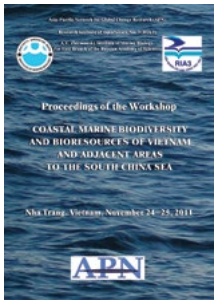
CBA2011-04NSY-IHDP: IHDP Training Workshops on Asian Development Pathways in the context of transitions towards a "Green Economy"
http://www.apn-gcr.org/resources/items/show/1682

CBA2011-11NSY-Tienhaara: Climate Change Governance in the Asia-Pacific Region: Agency, Accountability, and Adaptiveness
http://www.apn-gcr.org/resources/items/show/1689

CBA2011-16NSY-Li: Demonstration Study on Advancing Global Change Research Approaches Based on Inter-Agency Collaboration and Data Infrastructure of GENESI and GeoBrain
http://www.apn-gcr.org/resources/items/show/1694



Catalogue of the Living Bivalvia of the Continental Coast of the Sea of Japan (East Sea)
K.A. Lutaenko and R.G. Noseworthy
Russian Academy of Sciences Far East Branch, A.V. Zhirmunsky Institute of Marine Biology, Russian Far East Malacological Society
Vladivostok: Dalnauka, 2012. 247 p.
ISBN 978-5-8044-1261-7



Proceedings of Workshop on Coastal Marine Biodiversity and Bioresources of Viet Nam and Adjacent Areas to the South China Sea

Linda M. Peñalba, Dulce D. Elazegui, Juan M. Pulhin, Rex Victor O. Cruz, (2012) "Social and institutional dimensions of climate change adaptation", International Journal of Climate Change Strategies and Management, Vol. 4 Iss: 3, pp.308 – 322

APN Takes Major Step Forward for an Ecosystem Services Framework

22 July 2012, Bangkok, Thailand — The APN successfully organized a second scoping workshop on Ecosystem Services for Green Growth and Sustainable Development to further develop a new Ecosystems Services framework with the ultimate aim of integrating it into APN's strategic plan to support research, capacity development and science-policy interfacing efforts on ecosystem services in the Asia-Pacific region.

The workshop was attended by APN Steering Committee members and experts on biodiversity and ecosystems services from Japan and Malaysia. Participants contributed actively to the discussions on the current scientific and institutional landscape of research on ecosystems services and the links with green growth and sustainable development.

The APN's initiative of developing an ecosystems framework started in early 2011, at a time when the United Nations Convention on Biological Diversity announced the Decade on Biodiversity as a renewed effort to reduce the current rate of biodiversity loss at the global, regional and national levels. With the recent establishment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), an international mechanism to addresses the gaps in the science policy interface on biodiversity and ecosystem services, the APN increasingly realizes the need to contribute at the regional level to the work of IPBES, leveraging the APN's key strengths as a regional research network in Asia and the Pacific.

Participants to the workshop reviewed the APN Gap Analysis Report resulted from its initial scoping workshop held in February 2011. The report outlined the gaps and priorities identified by workshop participants with feedback global change community experts, which were group into the following themes:

- Drivers and pressures for biodiversity change that influence ecosystem services;
- Assessment of impacts of biodiversity loss and vulnerability to the shrinking of ecosystem services;
- Model-based prediction of changes in biodiversity and ecosystem services; and
- Adaptation, response and mitigation of the depletion of biodiversity and ecosystems services.

Discussions revolved around how APN could find its niche in supporting the international efforts in the field of biodiversity and ecosystems services by establishing a framework that brings APN's strengths into full play, while creating the necessary linkages between ecosystem services and green growth and sustainable development.

To ensure thematic balance under the proposed framework, it was pointed out that the framework should accommodate projects that address both natural and managed ecosystems in terrestrial, coastal and marine domains. The framework will encourage the examination of biodiversity in an integrative way which will address different aspects including its economic implications, the impact on livelihood of communities and the links with green growth and sustainable development, etc.

To strengthen the framework's relevance to and alignment with ongoing international mechanisms, participants reviewed key publications on biodiversity and ecosystem services, including the reports of IPBES sessions, outcomes of the Planet Under Pressure conference, and in particular the outcome document of United Nations Conference on Sustainable Development (Rio +20).

Participants further highlighted capacity building activities as an important area to which APN could actively contribute. In this context, the proposed framework could be designed to support human resource development, including technical training, exchange of experiences and expertise, knowledge transfer and technical assistance for capacity-building, which involves planning, management and monitoring capacities.

The result of the workshop will lead to an updated framework, which will be presented to APN 18th Inter-Governmental Meeting (IGM) in March 2013 for approval and integration into APN's Strategic Plan as a framework for supporting high priority activities identified in the area of ecosystem services in the context of green growth and sustainable development.

6th UN-CECAR International Conference on Renewable Energy

Dr. Linda Anne Stevenson
Executive Science Officer, APN Secretariat

The current and likely future impacts of climate change due to carbon emissions from burning enormous amounts of fossil fuels are considered among the most important challenges faced by human beings. The nuclear crisis caused by the Great East Japan Earthquake on 11 March 2011 had a significant effect on the energy policies of Japan and the world, highlighting the importance of renewables as clean energy sources. Now is the time to diversify the energy portfolio with renewables such as geothermal energy, solar energy, wind energy, bioenergy and hydropower. Renewable energy has almost unlimited potential and will provide energy security when fossil fuel is depleted.

The Asia-Pacific region is abundant in natural resources and has a great potential to utilize renewable energy from a variety of sources. Southeast Asia is rapidly adopting and developing renewable energy for power generation. There is also an increasing demand for new technical skills as businesses and industries take more interest in renewable energy, making renewable energy academic programmes highly sought after.

The University Network for Climate and Ecosystems Change Adaptation Research (UN-CECAR) is a network of universities and research institutes in the Asia-Pacific established in 2009, to develop research and education programmes on climate change adaptation, ecosystems change adaptation, and sustainability science. The network aims to bring together the best resources and expertise in joint research for the design of appropriate policy and development strategies, and development of postgraduate education courses and training across disciplinary lines.

The 6th UN-CECAR Conference on Renewable Energy took place at the "Pillar of the Kingdom", Chulalongkorn University—a campus located right in the heart of Bangkok, Thailand. The conference shared the knowledge, experience and technologies of renewable energy in the Asia-Pacific region to develop a new UN-CECAR curriculum on renewable energy. This pioneering programme aims to help prepare students in the Asia-Pacific Region to take the lead in providing renewable energy solutions to development needs with sound environmental management practices.

The first day was composed of three main sessions: Introduction to Renewable Energy; Policy and Implementation; and Economics, Finance and Business Opportunities. APN joined the conference on day 2.

Session 4, which focused on current research in the renewable energy field, covered issues such as microalgae biofuel research in Thailand; climate change risk for hydropower in Nepal; biomass energy in Indonesia, among others.

Session 5 on renewable energy needs and potential university education programmes, which also incorporated APN's presentation on climate adaptation and low carbon initiatives for sustainable development, covered a number of interesting presentations including macro policy in Indonesia, renewable energy needs in Sri Lanka; natural forest biomass energy planning in China, among others.

Session 6 addressed Education and Capacity Development in renewable energy and participants shared information on their present efforts in Thailand (both Chulalongkorn University and Asian Institute of Technology—AIT), Malaysia and the Philippines. This session also covered an interesting presentation from Indonesia that highlighted the need to change the mindset of society and incorporate macro policies

for energy supply and demand by considering renewable energy.

The Panel Discussion which was the final session of the conference was moderated by Professor Sivanappan Kumar of AIT. He summed up the two-day conference by stressing the interesting presentations from a wide range of expertise from the business sector and finance industries on day one and from other universities and educational institutions on day two. He reiterated that the global focus on renewable energy has become extremely important in recent years because of climate change and the need for sustainable development.

Professor Kumar stressed two main issues for renewable energy: unlike fossil fuels, renewable energy is site specific; renewable energy has far lower density of energy generation compared with fossil fuels, thus making renewable more expensive. Further, there are storage issues also in terms of supply and demand due to intermittent availability caused by seasonal changes or unsteady weather patterns. He finished by stating that society is accustomed to fossil fuel technologies for energy and it will not be easy to change the way we do things. This sounds like a simple problem, but will be a very challenging issue to address as the world attempts to move towards more renewable energy sources.

In the next 20 to 30 years we will expect about 25% of renewables in the Asia-Pacific region under a business-as-usual scenario. There is a hope that this will go much further and there will be a demand, therefore, for renewable energy specialists. There needs to be support from the policy sector as well as "out-of-the-box" thinking among those currently working in the renewable energy sector. For success, we will need to bring together chemical, mechanical and electrical engineers, as well as economists and social scientists to engage in multi-disciplinary efforts in order to make renewables an integral part of the energy expenditure in the Asia-Pacific region.

Dr. Srikantha Herath from UNU-ISP stated that renewable energy is important for mitigation and for adaptation options to climate change. He stressed the timeliness of the topic due to the recent nuclear crisis in Japan - there is now great interest in renewables in the country. "Coming together in this conference and sharing our experiences on courses and education practices in the various countries and their universities will help develop a potential course under the UN-CECAR framework," he said.

Professor Ir Tumiran from Universitas Gadjah Mada, Indonesia provided more context on why UN-CECAR was considering a renewable energy component, noting that his idea was generated three years ago when considering more carefully what was being addressed in the climate adaptation and ecosystem services components of the UN-CECAR programme. Professor Tumarin felt the necessity to focus on both upstream and downstream issues and stressed that present energy generation contributes immensely to the world's disasters, especially GHG emissions from the burning of fossil fuels. However, because of economic growth, energy demand is increasing and we must therefore look at other sources that are not detrimental to the Earth System - especially for the developing countries. There is a large problem in that, however, development of renewable energy is much more expensive than using non-renewable fossil fuels.

While developing a course on renewable energy is still at the very early stages, some important points were raised during the panel discussion that will be considered further during the strategic planning process to realize an intensive 64-lecture course on Renewable Energy. Some of these are:

- Undergraduates could be targeted for renewable energy courses and top teachers can be targeted for UN-CECAR courses;
- UN-CECAR courses should cover broad aspects of renewable energy;

Participants to the 6th UN-CECAR International Conference on Renewable Energy (Photo: Hideyuki Mohri)

- Social impact assessments should be addressed including processes in manufacturing renewable components; occupational health and safety, chemistry of renewable energy, etc.;
- Social aspects, such as the process of changing lifestyles and behaviours, needs to be integrated into the courses;
- Local authorities, business and small enterprises should be encouraged to move towards renewable energies. A great challenge remains at this level;
- The transition period from non-renewable to renewable must also be considered—in reality, both need to be handled, therefore mixed energy and hybrid systems should be considered;
- In order for students to consider appropriate policies, it is important for them to understand their own countries' situation regards natural resources available;
- There is a need to consider the national policy direction of each country;
- Debating activities would be useful to discuss current issues and develop more creative ideas.

APN at the 4th International Forum for Sustainable Asia and the Pacific

Yokohama, 24-25 July, 2012 — APN representatives Dr. Akio Takemoto, Director, Taniya Koswatta and Ratisya Radzi participated in the Fourth International Forum for Sustainable Asia and the Pacific (ISAP2012) held 24-25 July 2012 in Yokohama, Japan. The event was organized jointly by the Institute for Global Environmental Strategies (IGES) and the United Nations University Institute of Advanced Studies (UNU-IAS).

ISAP is an annual event to promote diverse discussions on sustainable development in Asia and the Pacific and to provide opportunities for information sharing and collaboration with experts and related organizations. Since the first ISAP in 2009, the APN has annually participated in the event and is supportive of their aim to develop innovative and strategic policy proposals towards sustainable Asia and the Pacific.

Following soon after the Rio+20 Conference in Brazil, the theme for this year was, "Steering Towards a Sustainable and Resilient Future: Beyond Rio +20.", focusing on topics such as Green Economy, Urban Development, Climate Mitigation, Sustainable Energy and Sustainable Development Goals. Prof. Hironori Hamanaka, Chair of the Board of Directors of IGES delivered his opening remarks and welcomed the participants on the first day of the Symposium.

Secretariat Members at APN Booth, 4th ISAP Forum

This was followed by speeches from Mr. Satoshi Takayama, the Parliamentary Secretary of the Environment, and Mr. Masao Kurokawa, Vice Governor of the Kanagawa Prefectural Government.

The APN attended the open sessions, selected expert workshops and network meetings on both days of the conference. The APN representatives were able to meet a few current and former APN project leaders and collaborators. The APN was also successful in further raising its profile and visibility by displaying and disseminating information materials at the exhibition and was pleased to be able to share its activities and findings with many young scientists participating in this year's ISAP conference.

For more information on the sessions and presentations of ISAP 2012, please visit the IGES website at: http://www.iges.or.jp/en/news/event/isap2012/index.html

APN Contributes to UNFCCC SBSTA Research Dialogue

Bonn, Germany, 19 May 2012 — The Subsidiary Body for Scientific and Technological Advice (SBSTA) of United Nations Framework Convention on Climate Change (UNFCCC) at its thirty-sixth session organized a research dialogue with participation of Parties to the Convention and representatives of relevant regional and international research programmes and organizations active in climate change research.

The APN was represented in the dialogue by Dr. Andrew Matthews, invited expert to the Steering Committee. Dr. Matthews presented APN's research and capacity-building initiatives aimed to improve scientific and technical capacities of nations in the Asia-Pacific region. He highlighted APN's new publication Climate in Asia and the Pacific: A Synthesis of APN Activities, which synthesizes 56 completed APN projects implemented over a 10 year period and provides recommendations for further strengthening research and capacity-building efforts in the region. He noted that many of the contributors to the report are authors of the IPCC Fifth Assessment Report (AR5) and it has been used as a tool for IPCC, scientists, decision-makers and educators alike, as it identifies both research gaps and future research activities for the Asia-Pacific region in the context of natural climate variability and climate change.

As an example of APN's current efforts, Dr. Matthews introduced the APN project "Greenhouse Gas Budgets of South and Southeast Asia" (ARCP2011-11NMY-Patra/Canadell) which aims to undertake the most ambitious synthesis effort to date using global and regional datasets and model outputs to constrain the regional GHG budgets of South and Southeast Asia, where the source/sink balance of GHGs have large uncertainty.

Dr. Matthews also introduced APN's new initiatives to be implemented starting from 2012, including new focused activities on Climate Adaptation through which the APN will develop a multi-year programme on climate adaptation, and a new initiative on low carbon development, which focuses on regional-based research, capacity development and networking activities.

The SBSTA Chair, in his summary report, commended that the presentations and participations by Parties has helped enhance SBSTA's understanding and knowledge on scientific issues in support of UNFCCC.

The research dialogue has become a successful forum for conveying research findings from the research programmes and organizations including APN, and for discussing needs for climate change research and research-related capacity building, particularly those of developing countries.

Dr. Andrew Matthews presenting at the SBSTA Research Dialogue

Needs Assessment for Capacity Development for IMBER in the Asia-Pacific Region

The Regional Project Office of Integrated Marine Biogeochemistry and Ecosystem Research (IMBER) organized a workshop in East China Normal University (ENCU), Shanghai, China, from 31 July to 4 August, to assess capacity development needs for IMBER research in the Asia-Pacific Region.

The workshop, entitled "Needs Assessment for Capacity Development for IMBER in the Asia-Pacific Region", was attended by prominent scholars and capacity-building experts from the integrated marine biogeochemistry and ecosystem research community from within and outside of the Asia-Pacific region, as well as representatives of major research institutes and international organizations in the field of marine research and oceanography, including the IMBER, the Scientific Committee on Oceanic Research (SCOR), the Partnership for Observation of the Global Oceans (POGO), the IOC Sub-Commission for the Western Pacific (IOC/WESTPAC) of UNESCO, among others. The workshop was co-funded by APN, IMBER, and State Key Laboratory of Estuarine and Coastal Research, East China Normal University.

This workshop was co-funded by APN and State Key Laboratory of Estuarine and Coastal Research (SKLEC) at ECNU. Main objectives of the workshop were to provide IMBER, relevant international agencies and decision makers with a scientific basis for developing a capacity development strategy to enhance integrated marine biogeochemistry and ecosystem research in the Asia-Pacific region. The workshop reviewed and evaluated current capacity development efforts within IMBER and other ocean science projects in the Asia-Pacific region, in order to identify gaps where additional capacity development is required. It was expected that the results of the workshop will assist Asia-Pacific countries to make appropriate contributions to regional and international IMBER research.

During the first two days of the workshop, all participants presented on their institutions' current capacity building efforts, main capacity needs, as well as the successes and challenges regarding integrated marine research, which provided a broad overview of the general landscape of capacity building in marine science.

The APN, represented by Mr. Xiaojun Deng, Programme Officer for Communications and Development, introduced through a presentation what APN has been doing to support capacity building efforts in the Asia-Pacific region. By introducing a number of

Participants to the Needs Assessment Workshop for Integrated Marine Biogeochemistry and Ecosystem Research in the Asia-Pacific Region

outstanding APN projects in this area, he noted that, as changes in the marine domain is a key thematic area of its science agenda for its Third Strategic Phase, the APN has been actively working with the science and policy-making communities across the region to strengthen interaction between and among these actors.

Following the presentations on day 2, there was a general discussions session that revolved around the major points and emerging issues identified. With the general recognition that capacity building must be long-term efforts that address shared gaps across countries, participants highlighted a number of common key concerns, including how different organizations can work together in a more coordinated manner to make the best use of available resources for capacity building while avoiding duplicated efforts, how to ensure long-term continuity of capacity building efforts, and how to evaluate the benefits of a capacity building project to young and early career scientists, etc.

In the following days of the workshop, participants met in breakout groups to analyse the capacity building needs identified so far, to evaluate the current status of capacity building practices, their implementation and impacts, and to carry out a forward-looking exercise of developing a "road map" that would contribute to long-term, concerted effort of IMBER capacity building across countries in the region. In particular, the following points were considered:

- A vision for regional capacity building in relation to new international initiatives such as Future Earth, Belmont Forum, etc;
- Ongoing capacity building activities in the region, their implementing institutions, and measures to enhance such activities as regional efforts;
- Resource development for enhancing regional capacity building; and
- How to link capacity building efforts of IMBER with broader capacity building efforts in the region.

The workshop concluded on 4 August 2012 as breakout groups reported back to the plenary with summaries of individual group discussions. Follow-up activities were also discussed.

Impacts of Global Change on the Dynamics of Snow, Glaciers and Runoff over the Himalayan Mountains and Their Consequences for Highland and Downstream Regions

Reference No.: *ARCP2009-04CMY-Shrestha*
Project Leader: *Dr. Kedar L. Shrestha*
http://www.apn-gcr.org/resources/items/show/1555

1. Background

Soon after the International Panel on Climate Change (IPCC) released its Fourth Assessment Report (AR4) in 2007 (IPCC, 2007), two statements therein, namely *(a) the high mountains of Asia till then remained a "white spot" and (b) all glaciers in the Himalayas could disappear by 2035*, drew the attention of all concerned and subsequently there seemed to be a surge in the studies and research activities on the dynamics of snow and glacier in the Himalayas as well as on their potential impacts on the runoff of the Himalayan perennial rivers. Meanwhile, the second statement after considerable discourse was altered into a new statement (IPCC, 2010).

Himalaya, the abode of snow (Fig. 1), has the third largest reservoir of snow and ice after Arctic/Greenland and Antarctic regions and is the source of all the major perennial rivers in Asia and provides fresh water to billions of people living in and around the region. In the Himalayan rivers like Indus, Ganges and Brahmaputra, glaciers and snow, for example, contribute important components of flows in the years of poor monsoon and reduce inter-annual and inter-seasonal variability during lean summer and post monsoon months. Global change, however, is likely to alter these flow patterns with adverse impacts on the economy in terms of water availability, food security and hydropower generation. In addition, rising population and the increasing pace of economic development will raise demands for fresh water in the scenario of plummeting availability of this resource. Hence understanding the impacts of global change on snow and ice dynamics in the Himalayas and their hydrological consequences has become urgent and important.

As a modest initiative, this two-year project on *"Impacts of Global Change on the Dynamics of Snow, Glaciers and Runoff over the Himalayan Mountains and Their Consequences for Highland and Downstream Regions"* (ARCP2008-16NMY-Shrestha) was initiated in the year 2008 with research grant from the APN with the following objectives:

- To assess the impacts of climate change on the dynamics of snow, glaciers and runoff over the Himalayan mountains;

Fig. 1 Asian high mountains with glaciers abound

- To assess the consequences for people's livelihoods and the economies and societies in the upland and downstream regions; and
- To provide scientific information to planners and policy-makers for identifying and implementing adaptation and mitigation strategies for sustainable development of the regions.

Four institutions from four different countries initially committed to work in the project as collaborating institutions (Box A), and three of them, namely **GCISC**, **GBPIHED** and **IDI** cooperated and actively participated in the three selected representative research basins namely, **Hunza** basin, **Upper Bhagirathi** basin and **Koshi** basin.

BOX A

Participating Countries & Institutions

China:	The Institute for Tibetan Plateau Research (TPI)
India:	The G. B. Pant Institute of Himalayan Environment and Development (GBPIHED)
Nepal:	The Institute for Development and Innovation (IDI)
Pakistan:	The Global Change Impact Studies Centre (GCISC)

The details on the research strategies and methodologies adopted to attain the above objective have been published earlier in the Mountain Research Initiative (MRI) Newsletter in 2009 (Shrestha, 2009). This article presents a brief description of key results of the study conducted during year 1 as well as the current activities during the year 2.

2. Project Approaches

As the rugged topography of Himalayas hinders field collection of scientific data in particular at high altitudes and over long periods, significant knowledge and uncertainty exist for proper understanding and assessing the impacts of global change on snow and ice dynamics as well as corresponding hydrology and consequent implications for highland and downstream communities.

In order to address such knowledge gaps and uncertainties, remote sensing and Geographical Information System (GIS) are used to determine the topographical features and to assess the status of snow and glacier dynamics of the region. Likewise, Regional Climate Models (RCMs) at the basin scales are run and used after necessary calibration and validation to provide meteorological conditions for contemporary as well as future periods. The obtained meteorological profiles with necessary bias corrections are then used to run suitable hydrological models to assess the impacts of climate change on the water availability in the selected basins both in space and time. Their consequent implications for highland and downstream communities are next studied using chosen appropriate tools.

3. Project Activities

The project activities focused on the three river basins that are selected as representative ones along the western, middle and eastern regions of the Himalayan range. Their geographical locations are shown in Figure 2. All the three chosen basins are highly glaciated. Glaciers like Hispar, Batura and Passu in the Hunza basin; Gangotri and Dokriani in the Upper Bhagirathi basin; and Khumbu and Imja in the Koshi basin are some of the well studied major glaciers in the region. The Koshi basin, with Mount Everest—the highest mountain on earth—almost at its centre, is the most rugged and the one with highest glaciers. Likewise, the Ganges river originates from the terminus of Gangotri glacier and Hunza river in the Karakoram region constitutes an important tributary to the Indus river originating from the northern side of the Himalayan range in the Tibetan plateau.

Fig. 2 The Selected Basins - Hunza, Upper Bhagirathi and Koshi along the Himalayan Range

3.1 Snow and Glacial Melt Runoff

In the high altitude snow/glacier fed basins of the Himalayan region, the cryospheric melt runoff constitutes an important component in the total runoff. Thus generating better estimates of snow and glacier melt contribution to the Himalayan river flows and the likely change in this component due to global warming are two of the major driving concerns.

Koshi Basin

Fig. 3 Koshi Basin

The Koshi basin broadly consists of seven major sub-basins (Fig. 3). Surface energy balance model in conjunction with comprehensive catchment model was used to assess the total runoff including its snowmelt/glacialmelt component. Shuttle Radar Topography Mission (SRTM) 90m digital elevation data were used to derive the Digital Elevation Model (DEM) of the basins. These together with meteorological data from nearby field stations were used to derive the climate parameters at the different altitudinal bands of the selected basins. Landsat 7 ETM+ images have been used to determine the extent and status of glaciers in the selected basins. The total melt volume comprising of snowmelt over bare ground area, debris-free glacier area, debris-covered glacier area, ice ablation under the debris layer and ice ablation from debris-free glacier for the year 2002 were calculated for all smaller glaciated parts of the basins. The melt volume for seven sub-catchments of Koshi basin is then found out by summing up the ones from the associated respective individual smaller basins and is shown graphically in percentages in Fig. 4.

The contribution of snow and glacier melt discharge to annual flow at the lowermost downstream station 'Chatara' is about 8.46% with a maximum monthly contribution of 22.52% in May and a minimum monthly contribution of 1.86% in January. The snow and glacier melt discharge from Dudh Koshi sub-basin is found quite significant. It has maximum contribution to annual flow at Chatara (2.51% out of total 8.46%). Whereas glacierized watersheds of Indrawati sub-basin have minimum contribution to annual flow at Chatara (0.15% out of total 8.46%). Dudh Koshi, Arun and Tamor basins are three major tributaries, which share 84% in terms of contribution of snow and glacier melt to the outlet of Koshi basin at Chatara. As almost half of the Arun river basin lies in

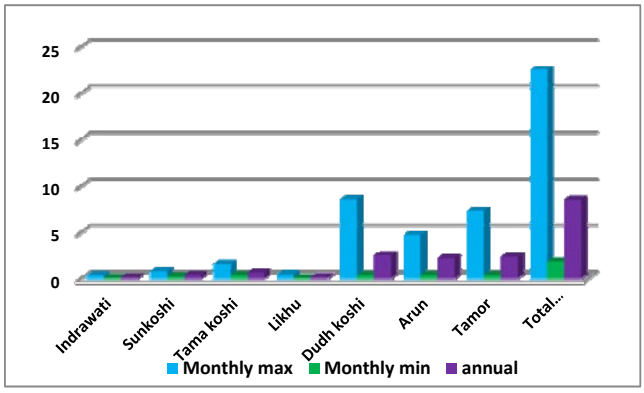


Fig. 4 Maximum and Minimum Percentages of Snow and Ice Melt Contributions in Total Flow at Chatara

		BASE			F1 (2020s)			F2(2050s)			F3 (2080s)		
		Flow	Snow	Glacier	Flow	Snow	Glacier	Flow	Snow	Glacier	Flow	Snow	Glacier
		(Cumecs)			(Cumecs)			(Cumecs)			(Cumecs)		
Annual Average		292.6	6.0	243.7	371.7	6.0	314.5	473.0	6.0	407.9	654.0	4.4	588.3
Seasonal	Spring	62.7	18.3	29.0	83.8	17.9	47.7	148.3	20.0	99.1	195.8	16.9	145.4
	Summer	933.2	5.1	856.4	1162.7	5.6	1065.8	1411.9	3.8	1309.1	1845.9	0.5	1757.6
	Fall	154.5	0.6	89.2	217.0	0.5	144.4	304.3	0.3	223.3	539.9	0.1	449.5
	Winter	20.2	0.0	0.0	23.4	0.0	0.0	27.6	0.0	0.0	34.3	0.1	0.7

Table 1. Control and Scenarios for Base Flow and Projected Flows in Hunza River including the Snow Melt and Glacier Melt Components

Tibet, which is not included in this analysis, its cryospheric melt contribution would obviously be significantly more than indicated here in this analysis.

Hunza Basin

The University of British Columbia (UBC) Watershed Model was applied to study the impact of climate change in the Hunza basin. The DEM (Digital Elevation Model) for the Hunza River basin has been taken from the ASTER global dataset at horizontal resolution of 30 meters. Physio-geographical characteristics such as glaciated area, forest cover, forest canopy density, impermeable area and orientation index along with the land area under each elevation zone have been calculated from the Land Cover and DEM gridded datasets from the US Geological Survey. The base flow and projected flows in Hunza River including the snow melt and glacier melt components for the periods 2020s, 2050s and 2080s as obtained from the control run covering the period 1966–1990 and the scenarios for the chosen periods are shown in Table 1. Assuming the extent and the volume of glaciers in the basin remaining constant, the calculated figures clearly indicates a monotonous rise in the total runoff in the river and turning more than double of the flow during the base period. While the snow melt component is found to be less prominent and it virtually drops to insignificance in the period 2080s, glacier melt is found to be the dominant component in the total flow throughout the period and with its contribution of about 82% in the control period and rising continually to about 90% in the 2080s period. Although the importance of glacier melt in the total runoff is significant, the results need however to be used with caution in view of the limited input data that goes into the UBC model.

3.2 Regional Climate Models (RCMs)

RCM	Driven by GCM	IPCC SRES	Resolution	Baseline Period	Projected Period	Applied Basin
PRECIS	ERA40	A2	50km x 50km	1961-1990	2020s; 2050s; and 2080s	Hunza
PRECIS	ECHAM 4					
RegCM3	ERA40					
RegCM3	ECHAM 4					
PRECIS	HadAM3H				2071-2100	Upper Bhagirathi
PRECIS	HadAM3P				2020s; 2050s; and 2080s	Koshi
RegCM3	ECHAM 4					Koshi
PRECIS	HadCM3	A1B	25km x 25km	Dec 1969 – Nov 1979	Dec 2039 – Nov 2069	Koshi
WRF	CCSM	A1B	10km x 10km	1970-2009	2051-2060	Dudhkoshi

Fig. 5 RCMs Run and Applied in the Selected Basins

For regional climate change impact studies, properly downscaled regional climate models (RCMs) are required in order to provide fine-resolution climate parameters for driving hydrological models to make future predictions of changes in the hydrological regimes.

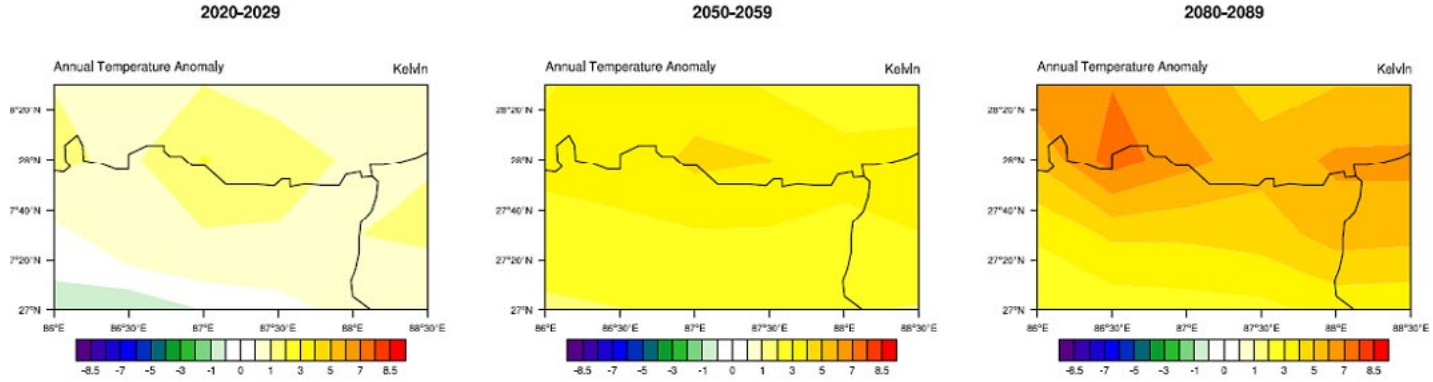


Fig. 6 Projected temperature change in Koshi basin

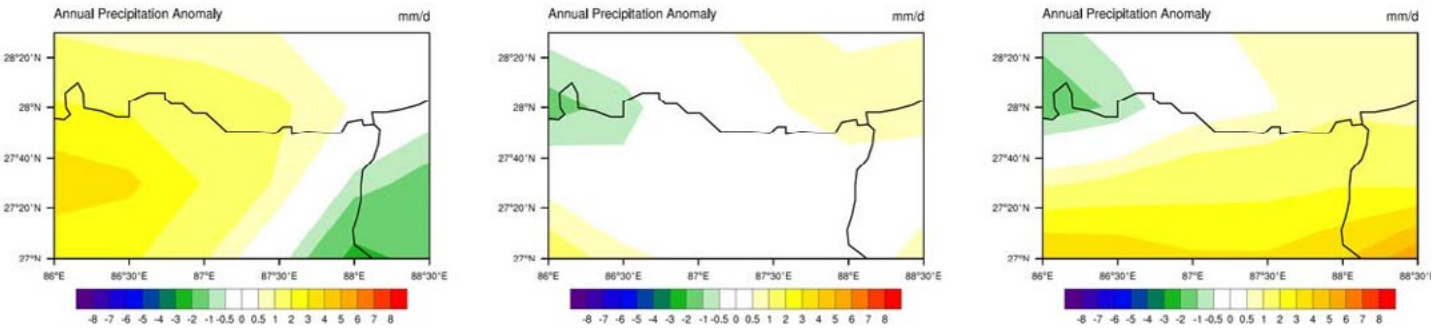


Fig. 7 Projected precipitation change in Koshi basin

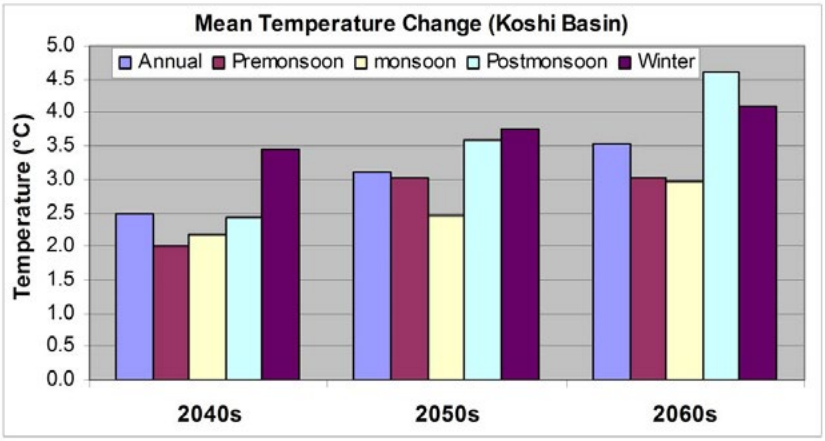


Fig. 8 Projected seasonal mean temperature changes in Koshi basin

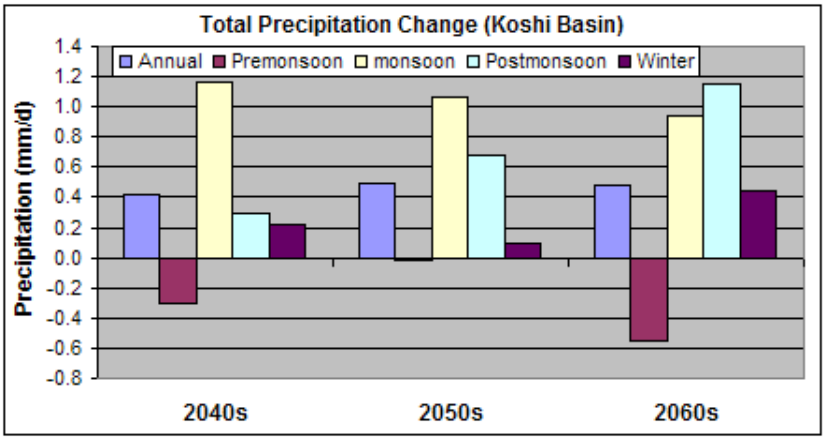


Fig. 9 Projected seasonal total precipitation changes in Koshi basin

The various RCMs downscaling different GCMs for certain IPCC SRES together with their resolutions are shown in Figure 5. Some of them after validation and necessary bias correction have been used to project the changes in the temperature as well as precipitation in the selected basins over chosen periods. The projected variations with spatial distribution for the Koshi basin for 2020s, 2050s and 2080s as obtained by using PRECIS at 50km resolution are presented in Figs. 6 & 7 for temperature and precipitation respectively.

Likewise, the projected annual and seasonal mean temperature and precipitation change for the Koshi basin in three decades as indicated by PRECIS run at 25 km resolution is presented in Figs. 8 & 9.

The higher trend of mean temperature changes in the high mountains in the north (Fig. 6) and during the post monsoon and winter periods (Fig. 8) are in particular notable. Similarly, the reduction in total precipitation in the high mountains in the north (Fig. 7) and during pre-monsoon period and enhanced total precipitation during monsoon and post-monsoon periods (Fig. 9) are also noteworthy. Model performance is also evaluated by comparing the computed and observed values averaged over the whole domain and model bias worked out.

Likewise, annual as well as seasonal analysis of temperature and precipitation change over Hunza basin for the various projection periods as obtained under PRECIS climate projections for A2 are shown in Table 2. Over the Hunza Basin, the annual temperature rise is 5.48°C by the end of the current century which is far more than the projected temperature increase for A2 globally i.e. 4.0°C. In the case of precipitation, about 10% increase has been observed by the end of the current century. The seasonal analysis of temperature shows higher temperature increase in autumn and winter than spring and summer temperatures. In the case of precipitation, increase has been observed for spring and winter seasons throughout the century but greater increase is

Table 2. PRECIS Climate Projection for A2 over Hunza basin

		Δ Temperature °C			Δ Precipitation %		
		2020s	2050s	2080s	2020s	2050s	2080s
Annual		1.58	3.21	5.48	4.25	9.34	9.94
Seasonal	Spring (MAM)	1.39	2.97	4.25	10.22	12.37	17.15
	Summer (JJA)	1.48	2.93	5.58	-9.42	-22.76	-26.46
	Autumn (SON)	1.66	3.17	6.37	-12.21	3.47	-14.70
	Winter (DJF)	1.78	3.75	5.72	13.65	23.06	33.97

Box B

Consultative Meeting and Workshops

❖ Initial Meeting	13 – 14 November 2008
❖ Joint Workshop	17 – 19 February 2010
❖ International Workshop	13 – 15 September 2010
❖ Scoping Workshop	21 – 22 February 2011
❖ Country Workshop-India	27 – 28 February 2012
❖ Country Workshop-Nepal	10 April 2012

observed in winter than spring (i.e. 34% with respect to base period). However, precipitation in summer and autumn are found to be decreasing by up to 26% and 15% respectively by the end of present century.

3.3 Consultations and Disseminations

A number of workshops and seminars have been held at different time with the objectives of consultations and exchange of knowledge and experience among key researchers, stakeholders and project partners (Box B). The country workshops held recently in India and Nepal were attended by almost all the active key actors in the respective countries in the field of climate change impacts on Himalayan Cryosphere. Hence the country workshops were found particularly helpful in updating the research strategy in the context of new research studies carried out during the gap period between the year 1 and year 2 of this two year project.

4. Way Forward

Water being an essential resource for all forms of life on our planet, variations in hydrologic regimes often have serious consequences and, thus, are a potential threat for society. Contemporary global and regional climate and other environmental changes pose immense challenge to Himalayan water resources management due to high spatial and temporal variation of resource endowment, and upstream-downstream linkages as a result of high degree of interrelationship among water uses and users as well as their transboundary nature. It is therefore necessary to provide best possible information regarding future changes in the hydrological cycle in such a way as to enable responsible decision makers to find possible strategies to mitigate or adapt to global change.

Hydrological models forced by climate parameters from the RCMs are being applied to make future predictions of changes in the hydrological regimes. The consequences of the projected changes in the hydrological regimes in terms of food security, hydropower development and upstream-downstream linkages are being studied. Policy implications of the envisaged changes are also being explored.

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Impacts of Global Warming on Coastal and Marine Ecosystems in the Northwest Pacific

Reference No.: ARCP2011-18NMY-Jung
Project Leader: Prof. Sukgeun Jung
http://www.apn-gcr.org/resources/items/show/1599

Background & Objectives

The highly-productive Western North Pacific has experienced dramatic changes in oceanographic conditions and ecosystem structure, driven by climatic changes and anthropogenic interventions. It is intended to conduct comparative studies across NOWPAP countries (China, Japan, Korea and Russia) to evaluate regional differences in the responses of marine ecosystems to the changes in the NOWPAP sea area (33-52°N; 121-143°E) by a working group composed of natural and socioeconomic scientists. This project was to provide scientific basis to decision makers in developing policy strategies that incorporate regional differences in 1) marine ecosystems supporting fish stocks, and 2) vulnerability and adaptation of fisheries industries to climate change.

The objective of phase one of this project (2011-2012) is to analyze spatial and temporal variability in oceanographic conditions and recruitments of major fish species in the NOWPAP sea area for the last 40 years.

Activities

To conduct retrospective analyses on times-series of climate and oceanographic data that has been collected and compiled by each involved country during the past 40 years; we held two workshops in 2012 at Jeju National University, Republic of Korea. During the first workshop (March 22-24), participants presented the research status and data availability of the participating countries with respect to climate change and fisheries, followed by dis-

Fish	Predictor temperature depth	Regression coefficient (degree °C^{-1})	Projected temperature change (°C)	Projected poleward shift (km)
Anchovy	10 m	-0.13	1.55	-23
Chub mackerel				
Horse mackerel	30 m	0.08	3.01	26
Pacific herring				
Pacific sardine	75 m	0.05	3.60	19
Common squid	10 m	0.29	1.55	50
Spanish mackerel	1 m	0.41	1.57	71
Yellowtail	1 m	0.22	1.57	39
Hairtail				
Yellow croaker				
Filefish				
Red horsehead				

Table 1. Poleward latitudinal shift of fishes from 2000s to 2030s, estimated by multiplying 1) regression coefficient of depth-specific water temperature on mean latitude of fish, and 2) temperature change projected by the general circulation model based on IPCC A1B scenario.

cussion on directions, obstacles and outputs of the project. After the first workshop, each national expert prepared a draft of national report by gathering information available in each country. We are going to compile four national reports into a regional report. During the second workshop (July 9-14), we tried to 1) synthesize past studies and available data from each participating countries, 2) project changes in biomass and habitat range of major fisheries species, and 3) plan activities for the second phase project (2012-2013). The final regional report is in compilation and edition.

Outcomes

We developed a general circulation model for the NOWPAP area (117~147°E, 23.5~52°N) to hindcast for 2000s and project for 2030s based on IPCC AR4 RCPs (Fig. 1). Based on projected changes in water temperature, we tentatively projected range shifts of distribution for major fisheries species in 2030s (Table 1).

Two papers were published in scientific journal, partially supported by the APN project:

Hwang K, Jung S (2012) Decadal changes in fish assemblages in waters near the leodo ocean research station (East China Sea) in relation to climate change from 1984 to 2010. Ocean Science Journal 47:83-94.

Kang YS et al (2012) Regional differences in response of mesozooplankton to long-term oceanographic changes (regime shifts) in the northeastern Asian marginal seas. Prog Oceanogr 97-100C:120-134.

Lessons learned from the two workshops

APN funding usually would not be enough to attain the objectives of any research project without securing other sources of research funding. Fortunately, the project leader received a climate-change related research grant from the Korean government for 2011/12. We recommend that the project leader or other collaborators secure additional research funding and share the outcomes with the APN project.

During the second workshop, two national experts could not attend, mainly due to schedule conflicts. Plan workshops as early as possible, and remind the participants repeatedly of the scheduled workshop. In addition, emails are sometimes not delivered, and we needed to double check whether mails were securely delivered. These minor problems can become major obstacles when holding an international workshop.

Coastal Marine Biodiversity of Viet Nam: Regional and Local Challenges and Coastal Zone Management for Sustainable Development

Reference No.: ARCP2011-10CMY-Lutaenko
Project Leader: Dr. Konstantin Lutaenko
http://www.apn-gcr.org/resources/items/show/1591

The APN Project ARCP2011-10CMY-Lutaenko was intended to study marine biological diversity in coastal zones of the South China Sea with emphasis on Viet Nam, its modern status, threats, recent and future modifications due to global climate change and human impact, and the ways of its conservation. The project involved participants from three countries (Republic of Korea, Russia and Viet Nam).

As a part of the project activities, the International Conference *Marine Biodiversity of East Asia Seas: Status, Regional Challenges and Sustainable Development* was held in the Institute of Oceanography, Viet Nam Academy of Science and Technology in Nhatrang in December 2010, and the workshop *Coastal Marine Biodiversity and Bioresources of Vietnam and Adjacent Areas to the South China Sea* was held in the Research Institute of Aquaculture N 3, Nhatrang, in November 2011.

Activities undertaken during the implementation of the project included limited field-works in southern Viet Nam, synthesis of the available data on biodiversity of Viet Nam collected during long-term research by Russian and Vietnamese scientists, preparation of the collective monograph, maintaining a website, and publications in peer-reviewed journals. The website of the project (http://www.imb.dvo.ru/misc/vietnam/) includes information on the project implementation, publications of the project participants, their CVs, information on two meetings held in Viet Nam in 2010 and 2011 and their proceedings.

The most interesting results obtained can be summarized as follows. According to a review by Dr. T. Dautova (Zhirmunsky Institute of Marine Biology), **surveys of coral reefs in Viet Nam** during the last 15 years showed that the area of coral reefs has been reduced by 15-20%, mainly in coastal waters of the central part of Viet Nam from Da Nang to Binh Thuan Province. Coal dust has caused the death to large areas of corals in the Ha Long and Bai Tu Long bays (Quang Ninh Province). Along with the coral reef area reduction, the number of species has also reduced. For example, the coverage of coral reefs in Bai Tien area (Nha Trang) was 30% (1984), there were 60 species. It was reduced to only 1% by 1998 and the number of species decreased to 30. Other living organisms were also reduced in number significantly. At present, all countries in the South China Sea have degraded reefs, from 95% in Hainan Island to an unknown amount in Viet Nam. Sustainable use and protection of the SE Asia coastal reefs are an extremely important issue.

Dr. Elena Kostina (Zhirmunsky Institute of Marine Biology) studied **biota of intertidal zone** of the Vietnamese islands from Namzu Islands (9°40′ N, 104°22′ E) in the Gulf of Siam to Daochao Island (20°50′ N, 107°20′ E) in the Gulf of Tonkin based on previously taken collections and belt-forming communities of macrobenthos were investigated in five bionomical types of the intertidal zone; this data may serve as a basis for future long-term monitoring of biodiversity changes. In the intertidal zone of studied areas, 101 plant and 268 animal species are found. Biota the Vietnamese Islands' intertidal zone is typical for tropical region of the Pacific Ocean. Tropical and tropical-subtropical species prevail (for the south Viet Nam coast – 54 species, or 34%, respectively, for the Central Viet Nam one – 61, or 33%, and for the North Viet Nam coast – 50, or 39%), faunal elements with wide distribution (from notal to boreal sea waters) is represented as well, but in low proportions. Macrobenthos of hard substrates (the rocky and rocky-

blocky-bouldery intertidal zone) is the richest in qualitative and quantitative compositions. Population of crumbly substrates (the silty-stony intertidal zone and sandy beaches) is the poorest. Any macrophytic algae in the upper horizon and the major part of the middle horizon of surf-open sandy beaches are not found. The intertidal zone of dead coral reef has no analogues in temperate waters.

The distribution of the taxonomical composition and the density of **meiobenthos** depending on some factors of environment have been studied in bottom sediments of the northern estuary part of Ha Long Bay for the first time (Drs. O. Pavlyuk, Yu. Trebukhova); a total of 66 species belonging to 17 families and 52 genera were identified. The estuary part of the Ha Long Bay is exposed constantly to anthropogenic impact from the sea port and to mainland drain of fresh waters which result in significant changes of salinity within a year. In general, differences in composition and distribution of meiobenthic communities in Ha Long Bay appeared to be connected with changes in granulometric composition of bottom sediments. The meiobenthos density at Nha Trang Bay reefs (southern Viet Nam) also shows an uneven distribution and depends on the sediment type. The correlation analysis revealed the dependence between the median diameter of sediment particles and the density of meiobenthos. However, taxonomic diversity of meiobenthos in Nha Trang Bay (twenty six groups) was greater than in other areas. Nematodes dominated in bottom sediments both in Nha Trang Bay itself and at its reefs. In total, representatives of four orders, twenty eight families and ninety seven genera were found in Nha Trang Bay. Nematodes made up to more than 90% of the total population density of meiobenthos at stations with high number of silt particles in sediments. Probably, the oxygen deficiency is a limiting factor for the penetration of animals into the depth of sediments in the central part of Nha Trang Bay.

The biodiversity of rare and little-known groups of invertebrates (nemerteans, sipunculids, opistobranch mollusks) of Viet Nam was studied for the first time. Twenty species in eleven genera and five families of Sipunculida are recognized from the total 371 individuals collected in southern Viet Nam. An analysis of the sipunculan literature has shown that 5 of these species are new records for Nha Trang Bay. 157 species of opistobranch mollusks are recorded in southern Viet Nam, about half of them for the first time. About 80 nemertean species belonging to 5 orders: Archinemertea (4 species), Tubulaniformes (2 species), Heteronemertea (32 species), Polystilifera (6 species), and Monostilifera (36 species) were collected in Viet Nam, a majority for the first time.

The extensive literature review was prepared with regard of bivalve molluscan biodiversity in the South China Sea: bivalves are a key group in benthos and economically are very important, being a major food in coastal areas. Regional differences in species richness of bivalves in the South China Sea are not clear. They rather reflect sampling efforts than real biogeographical phenomena. Lutaenko (2000) listed 367 species names of bivalve mollusks from Viet Nam based on the two largest Russian collections and it was the most complete list at that time. Based on available data, we may assume that the most rich faunas of bivalve mollusks are those of Viet Nam (more than 800 species) and Philippines-Indonesia (more than 1200 species). Diversity of bivalves appears to show increase from the north (Taiwan and Guangdong Province, 401-463 species) to the south (latitudinal gradient of biodiversity widely known in biogeography). Impoverished character of the bivalve faunas of the Tonkin Gulf and the Gulf

Participants to the workshop Coastal Marine Biodiversity and Bioresources of Vietnam and Adjacent Areas to the South China Sea (Research Institute of Aquaculture N 3, Nhatrang, November 2011)

Participants to the International Conference Marine Biodiversity of East Asia Seas: Status, Regional Challenges and Sustainable Development (Institute of Oceanography, Viet Nam Academy of Science and Technology, Nhatrang, December 2010)

of Thailand can be explained by significant river discharge which decreases salinity. Problem in molluscan biodiversity include a lack of taxonomic expertise in many countries surrounding the South China Sea. There are few professional malacologists trained in taxonomy, and there are few well curated research collections/museums with voucher specimens. A few young scientists want to devote themselves to traditional taxonomy due to a limited financial support and low prestige of this field of biology.

Threats to marine biodiversity in Viet Nam and adjacent areas include habitat degradation, fragmentation and loss (especially important are mangrove forest destruction, loss of coral reefs, change in landscape mosaic of wetland, estuary, sand and mud flats); global climate change including sea level rise, storm events, rainfall pattern change, warming of the coastal ocean; effects of fishing and other forms of overexploitation; pollution and marine litter; species introduction/invasions; physical alterations of coasts; tourism.

Through implementation of the project, we developed a network of scientists who are interested in future collaboration. Russian biologists traditionally collaborate with a number of institutions in Viet Nam and they would continue joint researches, fieldworks and holding joint meetings. The data obtained and summarized and interpretations of the coastal/ecosystem changes would be of use for development of recommendations for local/regional/national decision- and policy-makers and would contribute to current understanding of the tropical ecosystem of the South China Sea.

Publications:

T.N. Dautova and K.A. Lutaenko (Eds.). Proceedings of the International Conference *Marine Biodiversity of East Asian Seas: Status, Challenges and Sustainable Development,* Nha Trang, Viet Nam, December 6–7, 2010. 202 pp.

K.A. Lutaenko (Ed.). 2011. Proceedings of the Workshop *Coastal Marine Biodiversity and Bioresources of Vietnam and Adjacent Areas to the South China Sea*, Nha Trang, Viet Nam, November 24–25, 2011. Vladivostok-Nha Trang: Dalnauka, 2011. 123 pp.

Dautova T.N. Pathways for dispersal of the octocorals in the East Asia seas – inter-faunal connectivity and centres of biodiversity. *Bulletin of the Far Eastern Branch, Russian Academy of Sciences.* N 4. P. 31–39. [In Russian with English abstract].

Dgebuadze P.Yu., Fedosov A.E., Kantor Yu.I. Host specificity of parasitic gastropods of the genus Annulobalcis Habe, 1965 (Mollusca, Gastropoda, Eulimidae) from crinoids in Vietnam, with descriptions of four new species. *Zoosystema.* 2012. V. 34, N 1. P. 139–155.

Kantor Yu.I., Fedosov A.E., Marin I.N. An unusually high abundance and diversity of Terebridae (Gastropoda: Conoidea) in the Bay of Nha Trang, Viet Nam. *Zoological Studies* (in press).

Demonstration Study on Advancing Global Change Research Approaches Based on Inter-Agency Collaboration and Data Infrastructure of GENESI and GeoBrain

Reference No.: CBA2011-16NSY-Li
Project Leader: Prof. Guoqing Li
http://www.apn-gcr.org/resources/items/show/1694

The potential cost reductions for data searching, accessing and processing in Global Change Research (GCR) can greatly benefit scientists. New GCR approaches have been made possible from the evolution of data infrastructure under the GEOSS. Following the last APN project in 2009 on the introduction of such new data facilities and processes in Mongolia, this project focuses on live demonstrations and study approaches from the rebuilding of some typical GCR study cases (lake-ice changing in China Tibet, flood monitoring in Southern East Asia).

The main objectives of the project are:

1. To build a communication platform among leading international research communities (CEOS/WGISS, GEOSS, UN GAID and ICSU-CODATA), and Asia-Pacific area entities through technical transfers.
2. To make improvements in technology applications for training workshops and the work of technical support teams.
3. To help SE Asian scientists enhance and improve flood tracking through the application of new data service systems.
4. To help regional scientists to enhance and improve Tibetan Plateau research on lake ice changes through the application of new data service systems.
5. To generate guidance for how the world's next generation of data infrastructures can improve regional global change studies.
6. To develop prototypes of regional global change research data portals for harvesting and providing access to the necessary observational data from very large operational data facilities around the world.

This project is focusing on live demonstrations and study approaches using some typical global change research study cases, such as long-term lake ice-cover changes in the Tibetan area and fast flood tracking in Southern East Asia. The inter-agency collaboration data infrastructures of GENESI-DEC (Ground European Network for Earth Science Interoperations - Digital Earth Communities) and GeoBrain are used to provide scientific data for the mode change research.

The proposed technology transfer project covers several activities as follows (1) June 2011, notification of approval (2) August 2011, kick-off meeting and training workshop in Beijing (3) January 2012, implementation plan meeting and technical visit and live-demonstration work in Thailand (4) May 2012, technical visit and live-demonstration work in Xining/Lhasa (5) June 2012, final report to APN and to participating support entities (GENESI and GeoBrain)

Based on Inter-agency collaboration and data infrastructures of GENISI and GeoBrain, output of the project can assist developing countries in building capacity to access a larger sharing of multilateral and global research and development programmes. The developing countries can simply select the baseline technology and tools to build their information

Fig. 1 Flood case study workshop in Thailand

Fig. 2 APN - CODATA Joint Workshop, May 2012, Xining/Lhasa

systems and infrastructures for the global change research. The study areas and models can meet the APN's scientific agenda in sustainable development. This project can enhance scientific capacity in China and SE Asian countries to improve decision-making related to global change. The demonstration study in developing countries can help to assist these countries enhance their environmental capacity. Global change research and applications should also be a process to improve the communication and collaboration between different countries and agencies. This project can help the decision-makers in both developed and developing countries to know that it is important to consider inter-agency collaboration while they make their own country's plans. They also can realize that such architecture is based on effective data protection strategies.

Through the implementation of the project, many experience and inter-agency collaboration techniques for GCR has been obtained, which is potential for the future work. The international experience for young scientists and experts obtained from this project can be used in other developing countries. The collaboration technique from GC experts on how to use EO technology can be used in the related GC research project in the future. Also the experience of how to build data exchange platform and live demonstrations can serve GC experts as a live demo and useful showcase.

Report by: Dr. Jlbo Xie and Prof. Guoqing Li

Climate Change Governance in the Asia-Pacific Region: Agency, Accountability and Adaptativeness

Reference No.: CBA2011-11NSY-Tienhaara
Project Leader: Dr. Kyla Tienhaara
http://www.apn-gcr.org/resources/items/show/1689

Responding to climate change is likely to be the defining challenge of this century. The next generation of scholars, that will be at the forefront of mitigation and adaptation research in the pivotal period leading up to 2050, are now entering academia. Young researchers are tackling a wide range of climate issues from a variety of disciplinary perspectives. Although much of the important work focuses on the development of new technologies and improved understanding of the underlying biogeophysical systems, it is clear that effective and accountable governance systems will also be required to ensure that mitigation and adaptation strategies are implemented in a timely and equitable manner.

The Asia-Pacific region will face particularly grave challenges, including significant displacement of human populations, human health issues and loss of valuable ecosystem services, if climate change continues unabated. In order to address the challenges of responding to climate change in Asia and the Pacific, the Climate and Environmental Governance Network (CEGNet), in collaboration with the Earth System Governance Project, organized a workshop to build

capacity amongst early career governance researchers in the region, held at the Australian National University from 14-16 March 2012. The workshop was co-sponsored by the Asia-Pacific Network for Global Environmental Change Research (APN) and the Research School of Asia and the Pacific.

The workshop brought together an interesting and collaborative group of early career researchers from eleven Asia-Pacific countries. The presented papers covered a wide range of themes, applied a variety of methodologies and theories, and looked at examples from all over the region. Roughly, the papers could be clustered in five groups.

The first set of papers highlighted specific case studies of adaptation around the region. The second group examined in greater detail the financial and technical aspects of governing and enabling adaptation, especially at a local or sub-regional scale. A third set of papers provided a regional perspective on climate refugees/environmental migration - a topic that is generally strongly represented in the research of the Earth System Governance Project. A fourth group of papers addressed the interlinkages between climate change adaptation and health in Asia and the Pacific based on empirical research in a number of countries. The final set of papers emphasized the analytical problem of agency and examined the role of various state actors, non-state actors and networks in climate change mitigation and adaptation efforts in the region.

The process of engagement and interaction before and during the workshop, including over lunches and dinners, built the capacity of the young researchers that attended the workshop, not just academically but also in terms of networking. The workshop gave them an opportunity to present their research to an international audience and to receive feedback and support from each other as well as from leading researchers at the Australian National University. The participants also benefited from the opportunity to hear three eminent scholars – Prof John Dryzek, Prof Clive Hamilton and Prof Will Steffen – speak about various aspects of their ground breaking research on climate change and climate change governance.

The most important outcome of the workshop is that it brought early career researchers in contact with regional and global research communities and projects. The human network that was developed has the potential to grow significantly in size and strength in the coming years. In particular, many of the workshop participants are looking forward to meeting up again at the Tokyo Conference on Earth System Governance in January 2013. Another conference in the same series will be held in Canberra in 2015.

For more information on the Earth System Governance Project and associated Conferences, please see: http://earthsystemgovernance.org/

For more information on the Climate and Environmental Governance Network, please see: http://regnet.anu.edu.au/cegnet/home

For more information on the Research School of Asia and the Pacific, please see http://asiapacific.anu.edu.au/researchschool/

Dr. Kyla Tienhaara, Research Fellow, Australian National University

Mr. Ruben Zondervan, Executive Director, Earth System Governance Project

ARCP 2012/13 Projects

Project Reference	Project Title	Project Leader	Email
ARCP2012-01CMY-Patra/ Canadell	Greenhouse Gas Budgets of South and Southeast Asia	Dr. Prabir K. PATRA and Dr. Josep CANADELL, Research Institute for Global Change (JAMSTEC), Global Carbon Project (GCP) JAPAN/ AUSTRALIA	prabir@jamstec.go.jp
ARCP2012-02CMY-Fortes	Seagrass-Mangrove Ecosystems: Bioshields against Biodiversity Loss and Impacts of Local and Global Change along Indo-Pacific Coasts	Prof. Miguel FORTES, Marine Science Institute, University of the Philippines, PHILIPPINES	migueldfortes@gmail.com
ARCP2012-03CMY-Herath	Developing Ecosystem-Based Adaptation Strategies for Enhancing Resilience of Rice Terrace Farming Systems against Climate Change	Prof. Anura Srikantha HERATH, Institute for Sustainability and Peace, United Nation University (UNU), JAPAN	herath@unu.edu
ARCP2012-04CMY-Salik	Impact of Climate Change on Mangroves Ecosystem in South Asia	Mr. Kashif Majeed SALIK, Global Change Impact Studies Centre (GCISC), PAKISTAN	kashif.majeed@gcisc.org.pk,
ARCP2012-05CMY-Zhen	Holistic Assessment of Land-use Change and Impacts on Ecosystem Services of Wetlands	Dr. Lin ZHEN, Institute of Geographic Sciences and Natural Resources Research (IGSNRR), Chinese Academy of Sciences, CHINA	zhenl@igsnrr.ac.cn
ARCP2012-06CMY-IGBP	An International Geosphere-Biosphere Programme Synthesis Theme on: Global Environment Change and Sustainable Development: Needs of Least Developed Countries	Prof. João M.F. DE MORAIS, International Geosphere-Biosphere Programme (IGBP)	morais@igbp.kva.se
ARCP2012-07CMY-Mathukumalli	Tracing Nitrogen and Carbon Biogeochemical Processes in the Inter-tidal Mangrove Ecosystem (Sundarban) of India and Bangladesh: Implications of the Global Environmental Change	Dr. Bala Krishna Prasad MATHUKUMALLI , Earth System Science Interdisciplinary Centre, University of Maryland, UNITED STATES OF AMERICA	mbkp@umd.edu
ARCP2012-08CMY-Jung	Impacts of Global Warming on Coastal and Marine Ecosystems in the Northwest Pacific	Dr. Sukgeun JUNG, National Fisheries Research and Development Institute, REPUBLIC OF KOREA	sukgeun.jung@gmail.com
ARCP2012-09NMY-Meinke	Improving the Robustness, Sustainability, Productivity and Eco-Efficiencies of Rice Systems throughout Asia	Professor Holger Meinke, University of Tasmania, AUSTRALIA	holger.meinke@utas.edu.au
ARCP2012-10NMY-Li	Development of an Integrated Climate Change Impact Assessment Tool for Urban Policy-Makers (UrbanCLIM)	Dr. Yinpeng Li, International Global Change Institute, Waikato University, NEW ZEALAND	yinpengli@climsystems.com
APCP2012-11NMY-Quynh	Carbon Fluxes and Emission from the Red River (Viet Nam and China): Human Activities and Climate Change	Dr. LE Thi Phuong Quynh, Institute of Natural Product Chemistry (INPC), VIET NAM Academy of Science and Technology (VAST), VIET NAM.	quynhltp@yahoo.com

The Annual Regional Call for Research Proposals (ARCP) is one of the scientific pillars of the APN to encourage and promote global change research in the Asia-Pacific region that has potential, in addition to improving the 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. The ARCP is a competitive process launched in April 1998 to select projects for funding under the Science Agenda of the APN.

Project Reference	Project Title	Project Leader	Email
ARCP2012-12NMY-Roy	Coastal Ecosystem and Changing Economic Activities: Challenges for Sustainability Transition	PROF. Joyashree ROY, Global Change Programme, Jadavpur University, INDIA	joyashreeju@gmail.com
ARCP2012-13NMY-DeCosta	A study on Loss of Land Surface and Changes to Water Resources, Resulting from Sea Level Rise and Climate Change	Dr. G. S. DeCosta, Open Polytechnic of New Zealand, New Zealand	Gregory.decosta@openpolytechnic.ac.nz
ARCP2012-14NMY-Carter	Coral reef and water quality status and community understanding of threats in the eastern Gulf of Thailand	Assoc. Prof. RW (Bill) Carter, Sustainability Research Centre, University of the Sunshine Coast, AUSTRALIA	bcarter@usc.edu.au
ARCP2012-15NMY-Yoo	Toward a Fire and Haze Early Warning System for Southeast Asia	Dr. Jin Ho Yoo, APEC Climate Center, REPUBLIC OF KOREA	jhyoo@apcc21.net
ARCP2012-16NMY-Ochiai	GEOSS/Asian Water Cycle Initiative/Water Cycle Integrator (GEOSS/AWCI/WCI)	Mr. Osamu Ochiai, Associate Senior Administrator, Satellite Applications and Promotion Centre (SAPC), Japan Aerospace Exploration Agency (JAXA), JAPAN	ochiai.osamu@jaxa.jp
ARCP2012-17NMY-Burnett	Assessing the Impact of Climate Change and Development Pressures on Nutrient Inputs into the Mekong River and Tonle Sap	Prof. William C. Burnett, Florida State University, USA	wburnett@fsu.edu
ARCP2012-18NMY-Sase	Dynamics of Sulphur Derived from Atmospheric Deposition and its Possible Impacts on the East Asian Forests	Dr. Hiroyuki Sase, Asia Centre for Air Pollution Research, JAPAN	sase@acap.asia
ARCP2012-19NSY-Kamal	Assessing Climate Change Impacts on Salt Marsh and Seagrass Ecosystems in the South and South East Asian Coasts	Dr. Abu Hena Mustafa Kamal, Senior Lecturer, Department of Animal Science and Fishery, University Putra Malaysia, MALAYSIA	hena@btu.upm.edu.my
ARCP2012-20NSY-Musafer	Sustainable Biochar Systems in Developing Countries	Mr. Namiz Musafer, Practical Action Sri Lanka, SRI LANKA	namiz.musafer@practicalaction.org.lk
ARCP2012-21NSY-Siswanto	Climate Change and Human Impacts on Marine Biological Production in the Asia-Pacific Marginal Seas	Dr. Eko Siswanto, Institute of Geospatial Science and Technology, University Teknologi Malaysia, MALAYSIA	ekosiswanto@utm.my
ARCP2012-22NSG-Prayitno	Scoping Workshop to Develop Proposal: Vulnerability Assessment of Mangrove Biodiversity to Climate Change in Southeast Asia	Dr. Joko Prayitno, Institute for Environmental Technology, Agency for the Assessment and Application of Technology (BPPT), INDONESIA	joko2812@yahoo.co.id
ARCP2012-23NSG-Crawford	Scoping Workshop to Develop Proposal: Human Responses to Catastrophic Monsoon Events in South Asia, Designing a Spatially Explicit Model in Low-Lying Coastal Areas	Dr. Thomas Crawford, East Carolina University, USA	crawfordt@ecu.edu

CAPaBLE 2012/13 Projects

Project Reference	Project Title	Project Leader	Email
CBA2012-01CMY-Abawi	Building Scientific Capacity in Seasonal Climate Forecasting (SCF) for Improved Risk Management Decisions in a Changing Climate	Prof. Yahya ABAWI, National Climate Centre, Bureau of Meteorology, AUSTRALIA	y.abawi@bom.gov.au, yahya.abawi@usq.edu.au
CBA2012-02CMY-Hasson	Capacity Building in Advanced Remote Sensing (RS) & Geographic Information System (GIS) Techniques for Studying Snow & Ice Dynamics in Hindu Kush-Karakoram-Himalaya (HKH) Region	Mr. Shabeh Ul HASSON, Global Change Impact Studies Centre, PAKISTAN	shabeh.hasson@gcisc.org.pk, shabeh@gmail.com
CBA2012-03NMY-Rasul	Impact of Climate Change on Glacier Melting and Water Cycle Variability in Asian River Basins	Dr. Ghulam Rasul, Pakistan Meteorological Department, PAKISTAN	rasulpmd@gmail.com
CBA2012-04NSY-Kanie	The Exploring Effective Architecture for Emerging Agencies in International Environmental Governance	Dr. Norichika Kanie, Tokyo Institute of Technology, JAPAN	Kanie@valdes.titech.ac.jp
CBA2012-05NMY-Salinger	Rise Up: Pacific Futures	Dr Jim Salinger, Antarctic, Climate & Ecosystems CRC, University of Tasmania, AUSTRALIA	jim.salinger@utas.edu.au
CBA2012-06NSY-Zhang	International workshop: Needs assessment for capacity development for integrated marine biogeochemistry and ecosystem research in the Asia-Pacific region	Professor Jing Zhang, East China Normal University (ECNU), CHINA	jzhang@sklec.ecnu.edu.cn
CBA2012-07NSY-Fuentes	ASEAN Training Workshop on Building Capacity on ABS	Mr. Rodrigo U. Fuentes, Executive Director, ASEAN Centre for Biodiversity (ACB), UPLB, PHILIPPINES	rufuentes2@aseanbiodiversity.org
CBA2012-08NSY-Hongbo	Proposal for an International Workshop on MIS Problems in Northwest Pacific Region	Mr. Shang Hongbo, NOWPAP DINRAC, Policy Research Center for Environment and Economy, CHINA.	shang.hongbo@prcee.org
CBA2012-09NMY-Hashim	Global Environmental Change and Human Health: Extreme Events and Urbanization in the APN Region	Dr. Jamal Hisham Hashim, UKM Medical Centre, MALAYSIA	jamal@unu.edu; jamalhas@hotmail.com

The Scientific Capacity Building/Enhancement for Sustainable Development in Developing Countries (CAPaBLE) programme, which was launched in April 2003, is an initiative to realize parts 107 to 114 of the Johannesburg Plan of Implementation (JPOI) for the World Summit on Sustainable Development (WSSD) and is registered as a WSSD Type II Partnership Initiative. Of particular relevance is Part 111 of JPOI:

> *"Establish regular channels between policy-makers and the scientific community for requesting and receiving science and technology advice for the implementation of Agenda 21, and create and strengthen networks for science and education for sustainable development, at all levels, with the aim of sharing experiences and best practices, and building scientific capacities, particularly in developing countries".*

The CAPaBLE programme is enhancing scientific capacity in developing countries to improve decision-making relating to issues that are directly linked to their sustainable development. This effort is being achieved through a two-track process of capacity enhancement for experienced leading scientists and capacity development for early-career scientists under the APN Annual Call for Proposals.

Project Reference	Project Title	Project Leader	Email
CBA2012-10NSY-Zondervan	Governing Critical Uncertainties: Climate Change and Decision-Making in Transboundary River Basins	Dr. Ruben Zondervan, Executive Director, Earth System Governance Core Project of IHDP	ruben.zondervan@esg.lu.se
CBA2012-12NSY-Cruz	Enhancing the LGU Capacity for Implementing Conservational Farming Village and a Strategy for Climate Change Adaptation and Upland Environment	Prof. Rex Victor O. Cruz, Dean and Professor, College of Forestry and Natural Resources, UP Los Banos, PHILIPPINES	rexcruz@yahoo.com
CBA2012-13NSG-Bora	Capacity Building in Climate Change Mitigation through Precision Agriculture	Dr. Ganesh C. Bora, Assistant Professor and Interim Director, Agriculture and Biosystems Engineering, North Dakota State University, USA	ganesh.bora@ndsu.edu
CBA2012-14NSG-Adiningsih	Creating a Learning Network among Asian Planning Schools for Climate Change Adaptation Education and Enhancing the Interface with the Global Change Science Community	Dr. Hassan Virji, Executive Director, START, Washington D.C., USA. And Dr. Erna Sri Adiningsih, APN SEA-SRC; INDONESIA	hvirji@start.org
CBA2012-15NSY-Hiwasaki	Capacity Building to Strengthen Resilience of Coastal and Small Island Communities against Impacts of Hydro-Meteorological Hazards and Climate Change	Dr. Lisa Hiwasaki, UNESCO Jakarta Office, Regional Science Bureau for Asia and the Pacific, INDONESIA	l.hiwasaki@unesco.org
CBA2012-16NSY-Gordov	Capacity Building to Study and Address Climate Change Induced Extremes in Northern Asia	Prof. Evgeny Gordov, Siberian Center for Environmental Research and Training/Institute of Monitoring of Climatic and Ecological Systems SB RAS, RUSSIA	gordov@scert.ru
CBA2012-17NSY-Pradhananga	Preparation of Next Generation Leadership in Sustainability: An Approach in the Asia Pacific Region	Mr. Dhiraj Pradhananga, President, The Small Earth Nepal (SEN), NEPAL	info@smallearth.org.np; dhirajmet@hotmail.com

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2. **Republic of Korea:** Eunhae JEONG
3. **Indonesia:** Hermien ROOSITA

nFP for the host of the 18th IGM

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2. **Nepal:** Madan Lall SHRESTHA
3. **Russia:** Alexander STERIN

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2. Roland FUCHS (invited expert)
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4. Hiroshi TSUJIHARA (donor member)
5. Kazuhiko TAKEMOTO (invited expert)

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Calendar of Global Change Events

September 2012

11-13	International Conference on Climate, Water and Policy (ICCWP) 2012	Busan, REPUBLIC OF KOREA
25-29	Asia-Pacific Graduates' Youth Forum on Green Economy	Kathmandu, NEPAL

October 2012

4-5	IGFA Annual Meeting	Stockholm, SWEDEN
8-11	APEC Climate Symposium 2012	St. Petersburg, RUSSIAN FEDERATION
10-11	22nd APN Steering Committee Meeting	Kobe JAPAN
12-21	PICES 21st Annual Meeting	Hiroshima, JAPAN
16-17	1st Meeting of LoCARNet	Bangkok, THAILAND
22-26	5th Southeast Asia Sub-Regional Cooperation Meeting	Siem Reap, CAMBODIA

November 2012

9-13	4th South Asia SRC Meeting, Climate Workshop and PDTW	Kathmandu, NEPAL
12-23	UNCECAR/APN Training Workshop and Proposal Development Training Workshop	Bangkok, THAILAND
21-23	Regional Workshop on Future Earth	Kuala Lumpur, MALAYSIA

December 2012

3-5	3rd New Commons Workshop with APN, DIVERSITAS, IHDP and UNU-ISP	Kobe, JAPAN

January 2013 and beyond

28-31 January	Earth System Governance Tokyo Conference	Tokyo, JAPAN
11-12 February	2nd PAGES Young Scientists Meeting	Goa, INDIA
13-16 February	4th PAGES Open Science Meeting	Goa, INDIA
14-18 February	Annual Meeting of the American Association for the Advancement of Science (AAAS)	Boston, USA

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