Elements of a successful international field biology course: Lessons from the CTFS-AA experience

Rhett D. Harrison (Center for Tropical Forest Science, Education Director, c/o Forest Research Institute Malaysia, Kepong 52109, Selangor Malaysia
ctfs_aa_fieldcourse@yahoo.com).

CTFS-AA has run a series of 4-6 week courses in SE Asia since 2001 and built upon the previous experiences of the DIWPA courses. These courses commonly train 20 students from ten or more countries each year. Running a successful course depends on having appropriately selected students, on critical elements to the syllabus of the course, and on a certain amount of social engineering. Students who come with a greater diversity of interests and interact well tend to do better than those who simply have a good academic background. Good training on experimental design and data analysis and on building a hypothesis testing approach through student led projects are essential. This is further enhanced through requirements to give oral presentations and through the production of a course proceedings report. Forcing students to work in groups composed of students from other countries and to develop projects on topics not directly related to their own field also improves the fieldcourse experience. Currently CTFS-AA courses are over-subscribed approximately 3-4 fold and we do not advertise widely. A similar course run by Harvard University in Borneo is even more oversubscribed. Recognising the need for more courses in the tropical Asia-Pacific region, the Association for Tropical Biology & Conservation, Asia-Pacific chapter has under-taken to launch an expanded program of courses at the ATBC Bali meeting in July 2010. We are looking for collaborating institutions from Japan and elsewhere in the region.

Supporting and networking young scientists: the international training and research programme GAME (Global Approach by Modular Experiments) establishes a new concept in teaching marine sciences

Mark Lenz (IFM-GEOMAR, mlenz@ifm-geomar.de)

GAME is an international training and research programme for young marine scientists. In the framework of thematically oriented research projects on ecological issues, identical experiments are carried out simultaneously at different locations around the world. This approach is new in ecological science and is as innovative as it is efficient: Only globally comparable findings can provide insights that transcend biogeographical regions and ecosystem boundaries. Currently a total of 18 scholarships are awarded annually, shared among German and foreign students who carry out the bi-national experiments at nine locations around the world each year. The preparation and subsequent evaluation of each project, involving all participants, takes place at IFM-GEOMAR in Kiel. Approaches to ecological themes and data analysis using bio-statistical methods are studied in preparation for each experiment. In a post-project evaluation phase, all of the project findings are evaluated and interpreted comparatively and prepared for publication. The participants can develop their ability to communicate scientific knowledge in the form of lectures, degree theses, and contributions to international peer-reviewed journals. The students benefit from comprehensive guidance and supervision by German and international scientists for the entire duration of the project and beyond. Participation in a GAME project is therefore an excellent preparation for an international career in the field of marine biological research. In this presentation, the scope of the program will be outlined, its structure explained, and a list of the accomplished research projects presented.

Goals of Filed Training Courses in the Tropics:

Nature History or Global Change Issues?

Kanehiro Kitayama (Center for Ecological Research, Kyoto University;
kitayama@ecology.kyoto-u.ac.jp)

Field biologists in Western Pacific and Asia formed a research network, DIWPA (DIVERSITAS in Western Pacific and Asia), as a regional network under the international program DIVERSITAS in 1995. The primary goal of DIWPA was to activate regional research activities in biodiversity science and one of its joint projects was IBOY (International Biodiversity Observation Year) in 2001. DIWPA later initiated International Field Biology Course (IFBC) to draw the interests of young researchers/students in the region and to teach field techniques in association with IBOY. It was expected that IFBC could disseminate the importance of natural history and taxonomy among young scientists, who were anticipated to join IBOY. IFBC was actually continued in a range of ecosystems including tropical rain forests, islands and lakes until 2006. During 2004-2006, active taxonomist groups from Hokkaido Univ. and Kanazawa Univ. jointly conducted a series of IFBC in Indonesia together with Kyoto University. The past IFBC was oriented to natural history and taxonomy and were definitely fruitful in fostering young scientists. On the other hand, global environmental issues arose during the past two decades including global warming and the loss of biodiversity. Particularly, after IPCC released its 4th report in 2007, raising social adaptability to changing environments became a pressing social issue. In order to develop social adaptability, the knowledge on ecosystem functions has been increasingly sought. Every country needs to develop own capacity to observe biological and ecosystem changes and to predict a future trend. This is particularly so in the tropics, where deforestation is rapid but ecologists are scarce. Therefore, the future IFBC needs to strategically emphasize such capacity building, i.e. addressing the need to develop social adaptability and providing local young scientists with a chance to study ecosystem functions and to develop prediction capacity. I have formed the Borneo Rain Forest Forum to meet such a need and foster young scientists with a grant from JSPS Asia-Africa Science Platform Program. IFBC and related activities can be conducted under this program.

Visit http://diwpa.ecology.kyoto-u.ac.jp/aa/eng/aa_index.html

Introduction of JICA training course regarding watershed ecosystem management

Futoshi Nakamura (Hokkaido University; nakaf@for.agr.hokudai.ac.jp)

I have been involving in the JICA and other international training programs which aim to understand watershed ecosystem management for about 10 years. I would like to introduce one of the programs carried out in the Kushiro Mire, the largest wetland in Japan, in this workshop. The objectives of this program are 1) to understand importance of the wetland complex from the viewpoints of biodiversity (habitats for various wildlife), flood control and water quality, 2) to know the environmental problems which deteriorate the wetland ecosystem, and 3) to develop ideas how we cope with these problems and leave the healthy ecosystems for the next generation. The key is the catchment perspective because most of those environmental problems are attributable to cumulative impacts occurring in the above catchment, rather than one or two predominant causes.

Firstly, we take one day field trip to understand Kushiro Mire in a real world. We visit several key field sites to feel wetland ecosystem and its service, to understand current environmental problems from catchment perspective as well as in a longer term, and to see restoration activities of government agencies and NGO initiatives. The participants will get natural and social information not only from me but also from government and NGO peoples, and discuss with them in the fields.

Secondary, I will give one day lecture on the following themes.

1) Structure and function of river and riparian (wetland) ecosystem
2) Watershed management from the view point of production, transport and storage of materials (sediment, organic matter and nutrients) in a catchment
3) Restoration of forest, river, riparian and wetland ecosystems

Lastly, the participants (JICA foreign trainees and Japanese graduate student) are divided into several groups. Each group selects one of the themes I introduced or they may find the theme by themselves. For example, how can we restore forest, river or wetland ecosystem? How can we get active involvement of general public in watershed management or restoration project? How can we take a balance between ecological health and social and economical health? In the afternoon, each group presents their ideas and discusses future directions.

A Plan for International Field Course of Ecosystem Adaptability GCOE, Tohoku University

Tohru Nakashizuka (Tohoku University, toron@mail.tains.tohoku.ac.jp), Yasuhisa Hayashiyama (Tohoku University, yhaya@econ.tohoku.ac.jp) and Kazunori NAKAJIMA (Tohoku University, nakajima@econ.tohoku.ac.jp)

The Field Course for Ecosystem Adaptability is a part of the curriculum for PEM (Professional Ecosystem Manager), which is a certificate of PhD with managing ability of ecosystem cooperating and communicating with various stakeholders. Its objectives are, 1) to know the reality of the ecosystem management 2) to obtain interdisciplinary information by experts of various back ground, and 3) to discuss the possible solution for existing and emerging problems.

The first one will be held at Sarawak, Malaysia for about 10 days in September 2009, mainly targeting the management of tropical forests. The second one will be in China in 2010, focusing on the water resource and lake pollution. We are going to have the courses one time each year at least until the end of GCOE program.

The course in Sarawak will include the subjects, 1) ecology of tropical rainforests, 2) practice and process of timber production, 3) management of oil palm plantation, 4) life and culture of local people, 5) national park management, 6) local policy, and so on. The lecture by the experts of these fields will be given, and the participants will visit the sites in actual, and finally the participants will have discussions on selected issues. We hope the observation on the reality of the management and the discussion among participants (graduate students) with different back ground will also enlarge their range of thinking.

Activities of Overseas Research & Student Exchange Promotion Office and Plan for Summer school

Atsuko SUGIMOTO (Faculty of Environmental Earth Science,

Hokkaido University; atsuko@ees.hokudai.ac.jp)

The most important objective of IFES-GCOE Overseas Research & Student Exchange Promotion Office (ORES-PO) is to establish a long-term (100-yr) observation system for establishment of center for Integrated Field Environmental Science. We set three intensive observation regions (Siberia, Mongolia, Indonesia), where the ecosystems are expected to be vulnerable for climate change and impact of human activities, and extraction of important processes specific for each region is one of the key ideas of IFES-GCOE. Liaison offices are set up at Yakutsk, Ulanbaatar, Plangkaraya and Bogor, in order to enhance the activities.

Field Science Short Courses are planned to be held at Yakutsk in 2009, in Mongolia in 2010, and in Indonesia in 2011, under tight relationships between Liaison offices and ORSE-PO. Prior to the Field Science Short Course, Laboratory Short Course on Stable Isotopes was held as another activity of ORSE-PO in the last November at Sapporo. In my talk, this Laboratory Short Course will be introduced, since this course may be a prototype for the Field Science Short Course.

Laboratory Short Course is not just a technical training course. Attendants were categorized into two types, confined research project coordinators and trainees. Laboratory short course was composed of the confined research projects which were proposed by the attendants as project coordinators. During the course (one week), confined research projects were carried out, including preparations and measurements for stable isotope ratios, data analyses and discussions, and presentations at the last day of the course.

This laboratory short course and also planned field science short course have important aims for IFES-GCOE. One is an integration of scientific fields, and another is to coordinate a project. For the integration purpose, we invited students and young researchers from wide range of scientific fields, and put together for discussion in the course. We also expect that attendants as project coordinators had experiences in the course to coordinate a project and to teach their knowledge to trainees.

We are planning field science short course based on the practice of the laboratory short course described above.

IFES-GCOE Field Science Short Course 2009 at Yakutsk,

"The role of Permafrost Forest Ecosystems in the Global Climate Change"

Trofim Maximov (Institute for Biological Problems of Cryolithozone SB RAS; t.c.maximov@ibpc.ysn.ru), Atsuko Sugimoto (Hokkaido University)

In this report, status on GCOE establishment in Russia will be discussed. Activities of scientific field stations in the zone of long-term permafrost of Yakutia will be introduced in the talk, and also students and young scientists recruitments, plan for the summer schools on biogeochemistry at IBPC SB RAS at experimental forest station "Spasskaya Pad" will be presented. Special attention will be paid to items of maintenance and support of research regions' laboratory and experimental site, collection and analysis of scientific data and samples under academic exchanges, which are also regulated by Russian laws.

In October 2008 GCOE Liaison office was established at IBPC in Yakutsk. After the opening of the liaison office, two mini-seminars were held, and brochures introducing the activities of GCOE in Russian language were published, and also Russian website of the Centre was opened. Continuous correspondence with leading Russian universities and institutes has been made for a network, to enhance activities for capacity building for students and young scientists.

Date (tentative): July 30st (Thu) – August 4th (Tue) 2009

Place: Spasskaya Pad Experimental Forests of IBPC SB RAS

Organizer: Overseas Research & Student Exchange Promotion Office, IFES-GCOE, Hokkaido University

Co-organizer: IBPC SB RAS, Russia

Organizing committee: Atsuko Sugimoto (Hokkaido University), Trofim Maximov (IBPC SB RAS), Konstantin Krivoshupkin (Yakut State Univ, Russia)

IFES-GCOE http://www.ees.hokudai.ac.jp/gcoe/index.html

Russian GCOE http://www.gcoe.ysn.ru/

Introduction of Liaison Office of GCOE in Mongolia

Ya.Jambaljav[1], D.Battogtokh[1], D.Azzaya[2], S.Damdinsuren[3]

1. Geography Institute of Mongolian Academy of Sciences
2. Institute of Metrology and Hydrology
3. Biology faculty of Mongolian National University

Mongolia is located in the transition zone between the Siberian taiga and Steppe, and Central Asian Desert (Gobi desert), the country is very sensitive to shifts that can be caused by climate change and by over grazing. Records from land stations indicate that the mean annual air temperature has been increased by 1.56 ^{0}C since 1940. This increase of air temperature is twice more than average increase of air temperature in globe. Models of global climate suggest that northern boreal areas of globe, such as northern Mongolia, may warm more than other regions. Bohner and Lehmkuhl (2005) recently modelled the forest, glacier and permafrost spatial distribution based on empirical relationships in Central Asia for past and future climate scenarios, and anticipated a severe decrease of both glacier cover and permafrost extent.

In accordance with above mentioned the liaison office is established at environmentally vulnerable region, such as Mongolia, which has more environmental issues of academic field and of public field. Research target is degradation of land and ecosystem service resulted from combined impacts of global and social change.

Major activities of the Liaison Office will be 1) making web page, brochure, etc., to introduce research and educational activities of GCOE guidance for the admission for international students; 2) making community to enhance academic exchange; 3) conducting collaborative researches, summer school, workshop, symposium, etc; 4) assisting for applications of various permissions and documentations required for GCOE activities; 5) publishing text books and guidelines, 6) outreaching GCOE activities.

Introduction of Liaison Office of GCOE in Indonesia

Dr. Hanny C. Wijaya and Dr. Anas M. Fauzi

(Bogor Agricultural University (IPB))

Dr. Suwido H. Limin and Dr. Yanetri Asi Nion

(Center for International Cooperation in Sustainable Management of Tropical Peatland, The University of Palangka Raya (CIMTROP-UNPAR))

The main purpose of Indonesian sector in this GCOE project is to make scientific supports and evaluations for improvement of the peatland management practices through education and research.

We have continued to monitor the peatland ecology in peat swamp forests of Central Kalimantan. We have sufficient experiences for collaborative agricultural research between Japan and Indonesia through the core research program for "Environmental Management of Wetland Ecosystems in Southeast Asia" between the Research and Development Centre for Biology of the Indonesia Institute of Sciences (LIPI) and Hokkaido University for 10 years from FY 1997 to 2006. Through the project, we have created a strong partnership among the scientists in Hokkaido University, Bogor Agricultural University (IPB) and The University of Palangka Raya (UNPAR). Using the partnership, we will equip Liaison Office in IPB and UNPAR to smoothly conduct the GCOE project in Indonesia.

Major activities of the Liaison Office will be 1) making web page, brochure, etc., to introduce research and educational activities of GCOE guidance for the admission for international students; 2) making community to enhance academic exchange; 3) conducting collaborative researches, summer school, workshop, symposium, etc; 4) assisting for applications of various permissions and documentations required for GCOE activities; 5) publishing text books and guidelines, 6) outreaching GCOE activities.

Implementation of the GCOE program will be supported well, because CIMTROP-UNPAR has been already managed two areas of tropical peatland in Central Kalimantan and IPB has several sites in Sumatra.

GCOE-INeT International Summer School 2009,

"Frontiers in Ecosystem Ecology of Northern Forest"

Hideaki Shibata (Hokkaido University; shiba@fsc.hokudai.ac.jp), Takashi Kohyama (Hokkaido University; kohyama@ees.hokudai.ac.jp), Karibu Fukuzawa (Hokkaido University; karibufukuzawa@yahoo.co.jp)

Analyses of ecosystem processes across various spatial and temporal scales are essential to clarify ecosystem functions and services under global climate changes, air pollution, land-use changes and other anthropogenic and natural disturbances. This summer school provides unique opportunities for Ph D international and Japanese students to learn field research methods. Students will also discuss current research findings and explore future directions for various research topics on ecosystem ecology. The main aim of the program is to encourage the participants to develop research projects that include international perspectives. The field training program will be conducted in Hokkaido University's experimental forests that are included within the JaLTER (Japan Long-Term Ecological Research Network).

Date: June 14st (Sun) – 20th (Sat) 2009

Place: Hokkaido University Sapporo campus and North Hokkaido Experimental Forests (Teshio, Nakagawa and Uryu Experimental Forests)

Organizer: International network and training office (INeT), GCOE of Hokkaido University

Co-organizer: Field Science Center for Northern Biosphere, Hokkaido University, Japan Long-Term Ecological Research Network (JaLTER)

Organizing committee: Hideaki Shibata*, Takashi Kohyama**, Toshiya Yoshida, Kentaro Takagi, Masahiro Nakaoka, Karibu Fukuzawa (Hokkaido University), Myron J. Mitchell (Invited professor, State University of New York, College of Environmental Science and Forestry, USA) *Chief, **Vice-Chief

GCOE-INeT http://www.ees.hokudai.ac.jp/gcoe/en/inet/index.html