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Report on the International Workshop on Flux Observation and Research in Asia

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The International Workshop on Flux Observation and Research in Asia was held successfully in December 1-3, 2003, in Beijing, China. The workshop was organized by ChinaFLUX and AsiaFlux with the support of FLUXNET and ILTER Asia-Pacific Region Network, and was sponsored by ChinaFLUX, AsiaFlux, the National Natural Science Foundation of China (NSFC), and the International Cooperation Bureau of Chinese Academy of Sciences (CAS).

The purpose of this workshop is to further promote the communication among scientists engaged in flux measurement sites in the world and to advance the study of flux observation in Asian countries.

More than 180 participants attended the meeting, including scientists and students from research institutions and universities in USA, Australia, Japan, Korea and China. The opening ceremony was chaired by Chen Panqin, Deputy Director of Bureau of Science and

Technology for Resources and the Environment (BSTRE), Chinese Academy of Sciences (CAS). Welcoming speeches were addressed by Fu Bojie, Director of BSTRE/CAS and Liu Jiyuan, Director of the Institute of Geographic Sciences and Natural Resources Research, CAS. Representatives from AsiaFlux, FLUXNET, KoFlux, etc. also delivered their speeches during the opening ceremony.



Opening ceremony of the workshop



Eleven invited presentations were made by Susumu Yamamoto, Masataka Watanabe and Nobutaka Monji from Japan; Joon Kim from Korea; Ray Leuning from Australia; Gu Lianhong, John F. McCarthy, and Bertrand Tanner from USA; Chen Jiayi, Chen Panqin, and Li Xiubin from China, at the plenary session respectively.

A total of 56 oral presentations were made at four sessions and 48 posters were presented. The workshop includes the following topics:

- Eddy fluxes measurements;
- Soil and plant respiration fluxes;
- Mechanism of carbon and water cycles and the modeling;
- International collaboration on flux measurements and research.

Through 3-day discussion, it was concluded that there are still several issues in flux observation that need to be addressed, such as the estimation of CO₂ exchange in complex topographical area and under stable atmospheric conditions, the evaluation of flux data. And how to scale up from site observations to regional estimates remains a great challenge to the researchers. It was



A snapshot during the International Workshop on Flux Observation and Research in Asia

finally agreed that integration of flux observation, remote sensing, and modeling might be an efficient way to conduct study in carbon cycle. It was recommended that closer cooperation among scientists should be established to improve the exchange of ideas about flux researches and expand the impact of Asian flux research in the world. The workshop calls for more openness on exchange of data and techniques.





Synthesis Workshop on the Carbon Budget in Asian Monitoring Network -The decennial anniversary of the observation at Takayama site-

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1. Introduction

The workshop was held from 21 to 22 Oct. 2003 at Hotel Associa Takayama Resort, Takayama City, Gifu Prefecture, coinciding with the 10th anniversary of the initiation of monitoring activity on forest carbon cycle at Takayama. The study was started in the suburbs of Takayama city in collaboration with the National Institute of Advanced Industrial Science and Technology (AIST) [formerly the National Institute for Resources and Environment of the Agency of Industrial Science and Technology], and the River Basin Research Center, Gifu University. The workshop was co-organized by these two organizations with the financial support from Takayama city and the Japanese Ministry of Education, Culture, Sports, Science and Technology [a science technology coordination fund].



On the way to Takayama site

2. Outline of the workshop

The aim of the workshop is to 1) compile data at Takayama monitoring site since its establishment, 2) find ways to utilize such data for analysis of carbon balance in the entire Asian region, and 3) interact with other networks on the atmospheric environment such as the East-Asia Acid Monitoring Network (EANET), within the overall context of specific Asian climate conditions characterized by the monsoon. The workshop

had 24 oral presentations, including four invited presentations, and nine poster presentations. The total participants were 68. A field trip to the site was conducted in the afternoon of 22 Oct.

Four invited speakers, including T. Totsuka, Director of the Acid Rain Research Center, J. Kim, Professor of Yonsei University, G. Yu, Deputy Senior Staff of Chinese Academy of Science, and N. Nishimura, former professor of Toyama University, made presentations on

the first day. T. Totsuka reported activities of the acid rain monitoring network in the eastern Asia region and research training in Japan. J. Kim introduced KoFlux of Korea and stressed the importance of coordination with remote sensing and modeling techniques. G. Yu intro-

duced ChinaFlux, which was established in 2002. In the discussion, it was felt that the acid rain network had not reached a status yet where its research results were reflected in national policies, and that the current AsiaFlux was not always working as a cohesive network in Asia perhaps because of the advantage of ease in obtaining financial support from each government, if flux networking was set up at a national rather than regional level.

S. Murayama, AIST, reported the significantly large contribution of cumulative solar radiation in July (related with the Asian monsoon) to the yearly differences in



the minimum level CO₂ concentration or sharp CO₂ reduction during summer. He also confirmed a gradual yearly advancement in the date of record of CO₂ concentration below the annual average during transition period from the high CO₂ level in winter to the low level in summer, and the annual increase in the difference in CO₂ concentration between the top and bottom layers of the forest canopy.

N. Saigusa, AIST, reported that high NEP values were recorded in both 1998 and 2002, when leaf expansion period commenced much earlier than in other years and that there was an increasing tendency of NPP of forest canopy during the past 10 years. F. Ohtsuka, Ibaraki University, reported that the growth of forest canopy in 2002 measured in terms of trunk diameter was almost twice more than in any year between 1999 and 2001, and that the observations were consistent with the NEP data of N. Saigusa.

The compilation of data during the past decade at Takayama site, therefore, helped us initiating the discussion on the growth of forest ecosystem and its annual trends. Further monitoring is necessary, however, to draw various scientific conclusions on forest ecosystem. At Takayama site, studies were initiated in collaboration with researchers of both terrestrial ecosystems and

atmospheric science. N. Nishimura, who played a key role in establishing this site, stressed that the human networking and association were much more important than the identification of research objectives and site selection. There were various controversial issues in terms of the geographical feature or the terrestrial ecosystem on the implementation of monitoring at Takayama. Although not all the issues have been resolved, researchers of remote sensing or modelling have had great interests in the data obtained in this site and had made use of the data in their presentations.

3. Conclusion

On the second and final day of the workshop (22 October), it was continuously raining since morning but all of a sudden, the weather became clear when participants arrived at the site. The participants could enjoy the beautiful mountains with a rich variety of autumn tints (photograph). Although there is no prospect for obtaining financial support, I wish to stress the continuation of monitoring at least till 2050. The next workshop will be held in 2013 on the occasion of the 20th anniversary.

Report on Larch Planting Ceremony and Workshop at CC-LaG (Carbon Cycle and Larch Growth) Experiment Site

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The Center for Global Environmental Research (CGER) established two monitoring sites in Hokkaido: Tomakomai flux research site located in the Tomakomai National Forest, Tomakomai City, and Teshio CC-LaG (carbon cycle and larch growth) experiment site in the Teshio Experiment Forest, Field Science Center (FSC) for Northern Biosphere, Hokkaido University, Teshio County. These sites were set up to carry out comprehensive field studies for understanding carbon cycle and the role of forests in the global warming and have become crucial core centers for flux monitoring in these boreal



Photo 1 At the planting ceremony



Photo 2 A presentation of the workshop

forests. At the Tomakomai site, CGER has been carrying out a field study in a homogeneous *Larix* of about 40 years old with the cooperation of Hokkaido Regional Forestry Office. At the Teshio CC-LaG experiment site, a monitoring project has been implemented to investigate the change of carbon balance in a growing forest through the interdisciplinary cooperation of FSC, Hokkaido Electric Power CO., Inc., and CGER. For this purpose, 14 ha of conifer-hardwood mixed forest was clear cut in January 2003, and then 33,000 saplings of 2-year old hybrid larch (*Larix gmelinii* x *L. Kaempferi*) were planted.

With the concern of snowing in the sunny afternoon of October 28, 2003, a commemorative planting ceremony was opened at the Teshio CC-LaG experiment site with 130 participants, including representatives from the three organizations involving in this project and 41 local school children of Toikanbetsu Elementary School. In the ceremony, larch was planted after an opening address made by several guests, including Mr. Chida, Deputy Mayor, and Mr. Sugawara, Superintendent of Education in Horonobe. Later, a small workshop was held at the Toikanbetsu Community Center near FSC Teshio experiment office,

and the outline of CC-LaG project was presented. The workshop was continued in the following day until noon. Leading organizations in the carbon cycle study presented various subjects*, including the future of FFPRI (Forestry and Forest Products Research Institute) Flux Network and Tomakomai site, carbon researches on the breeding of the hybrid larch, carbon sequestration rate in boreal forests, and application of remote sensing on forest monitoring. Eight speakers reported research results obtained in these two sites. Further, representatives from these three organizations gathered and discussed lively the future perspectives of this project and how to promote it effectively.

We hope that, through this event, all participants will recognize the significance of this project as a scientific contribution to the understanding of global warming. It is a great pleasure for all of us if some school children involved in this project will have great interests in monitoring research and join us in the future. Lastly, we express our gratitude to FSC for leading the efforts that have made this event a success.

* [AsiaFlux Newsletter No.7](#)



Photo 3 Representatives are having a discussion at the Toikanbetsu Community Center.



MEETINGS & EVENTS

Date	Place	Title	Information
11-15 January 2004	Seattle, USA	84th American Meteorological Society Annual Meeting	http://www.ametsoc.org/meet/84annual/index.html
20-22 January 2004	Tashkent, Uzbekistan	International Workshop on Global Change, Sustainable Development and Environmental Management in Central Asia	http://www.start.org/project_pages/gec_central_asia.html IGBP http://www.igbp.kva.se/
2-6 February 2004	Bangalore, India	7th Global Spatial Data Infrastructure Conference	http://www.gsdi7.org.in
10-12 February 2004	Leipzig, Germany	International Conference: GHG emissions from Agriculture - Mitigation options & strategies	http://www.ie-leipzig.de/midair.html
27-29 February 2004	Banff, Canada	2004 Annual Meeting of Fluxnet-Canada	Fluxnet-Canada http://www.fluxnet-canada.ca/
23-25 March 2004	Darmstadt, Germany	Global Geostationary Fire Monitoring Applications; A Joint GOFC/GOLD Fire and CEOS LVP Workshop	http://gofc-fire.umd.edu/index.asp
24 -26 March 2004	Antwerp, Belgium	Second International SPOT - VEGETATION Users Conference	http://www.vgt.vito.be/vgtapen2004.htm
19-21 April 2004	Vienna, Austria	Modeling Forest Production: Data Needs and Sources	CARBOEUROPE http://www.bgc-jena.mpg.de/public/carboeur/index.html
3-7 May 2004	Fairbanks, USA	Climate Disturbance Interactions in Boreal Forest Ecosystems	http://www.lter.uaf.edu/ibfra/default.cfm
3-21 May 2004	Laxenburg, Austria	Advanced Institute on Vulnerability to Global Environmental Change	http://www.start.org/links/announce_oppo/P3_Announcement.pdf
17-21 May 2004	Montreal, Canada	2004 Joint Assembly: AGU, the Canadian Geophysical Union, and the Society of Exploration Geophysicists	http://www.agu.org/meetings/sm04/
14-17 June 2004	Osnabruck, Germany	The International Environmental Modelling and Software Society Conference	http://www.iemss.org/iemss2004/
25-30 July 2004	Utrecht, Netherlands	The 7th INTECOL International Wetlands Conference	http://www.bio.uu.nl/intecol/index2.php
16-20 August 2004	Honolulu, USA	2004 Western Pacific Geophysics Meeting	http://www.agu.org/meetings/wp04/
23-28 August 2004	Vancouver, Canada	American Meteorological Society, 26th Conference on Agricultural and Forest Meteorology	http://www.ametsoc.org/meet/fainst/vancouver2003.html
7-11 September 2004	Fukuoka, Japan	International Symposium on Food Production and Environmental Conservation in the Face of Global Environmental Deterioration	http://www.agr.yamaguchi-u.ac.jp/users/fp ec
19-22 October 2004	Tsukuba, Japan	The 6th International Symposium on Plant Responses to Air Pollution and Global Change	http://apgc2004.en.a.u-tokyo.ac.jp
13-17 December 2004	San Francisco, USA	2004 AGU Fall Meeting	http://www.agu.org/homepage.html



Recipient: Nobutaka MONJI

(Graduate School of Agriculture and Biological Sciences, Osaka Prefecture University)

Date: September 9, 2003

Award: Society of Agricultural Meteorology of Japan Award

Research: Theoretical Study on Greenhouse Gas Flux Measurements over Forests

Recipient: Gen INOUE (Center for Global Environmental Research, National Institute for Environmental Studies)

Date: October 16, 2003

Award: Horiuchi Award of Meteorological Society of Japan

Research: Pioneering Research of Greenhouse Gases Monitoring



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Editor's Note

The Takayama Workshop encouraged me a lot. Thank you for your friendship and goodwill.



With best wishes for a Happy New Year!

The editor of AsiaFlux Newsletter No.8:
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The editor of AsiaFlux Newsletter No.9 will be Kentaro TAKAGI (Hokkaido University).