



Global Environmental Change-Japan

International Symposium on Future Asia Bridging Science, Technology  
and Society: Practices of Transdisciplinary Implementation on  
Sustainability and Environmental Change in Future Asia

# International Geosphere-Biosphere Program (IGBP)-Japan initiatives

**Mitsuo Uemtsu**

IGBP SC Member

Atmosphere and Ocean Research Institute

The University of Tokyo

Chiba, Japan

GLOBAL  
**IGBP**  
CHANGE

At RIHN Lecture Hall, Kyoto, Japan  
13-14 December 2012



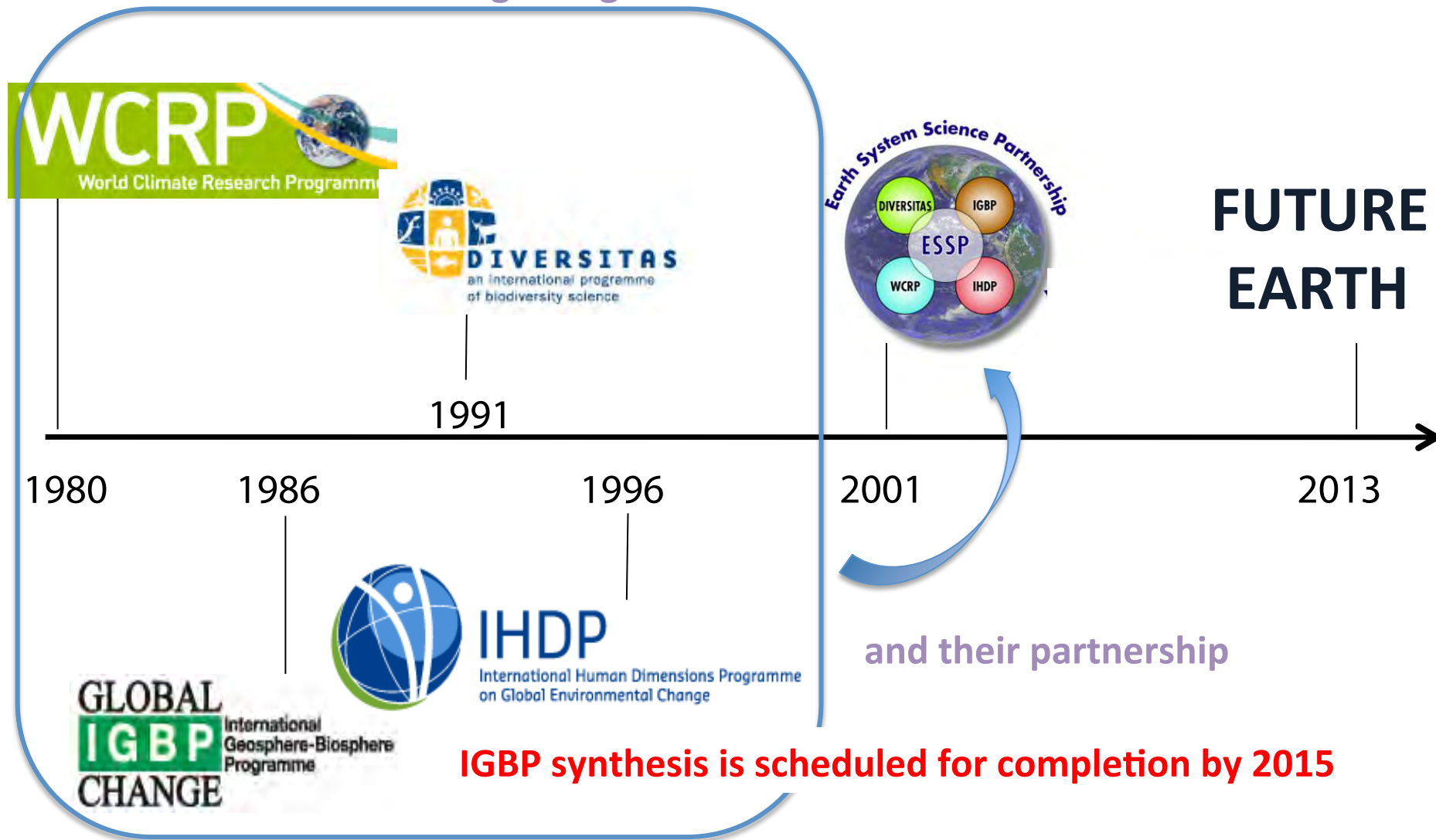
# IGBP Strategic Vision

Fundamentals of the Earth system  
Impacts of environmental disturbances  
Bio-geophysical and social diversity  
Resource management  
Mitigation and adaptation



# Future Earth: building from the GEC programmes a framework to unify existing bodies

## Global Environmental Change Programmes



all co-sponsored by ICSU

Note: WCRP/WMO as observer

# Integrated Earth-System Approach

Atmosphere

Land - Atmosphere

Land

Land - Ocean

Ocean

Ocean - Atmosphere

Integration - Synthesis





# Integrated Earth-System Approach



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CHANGE

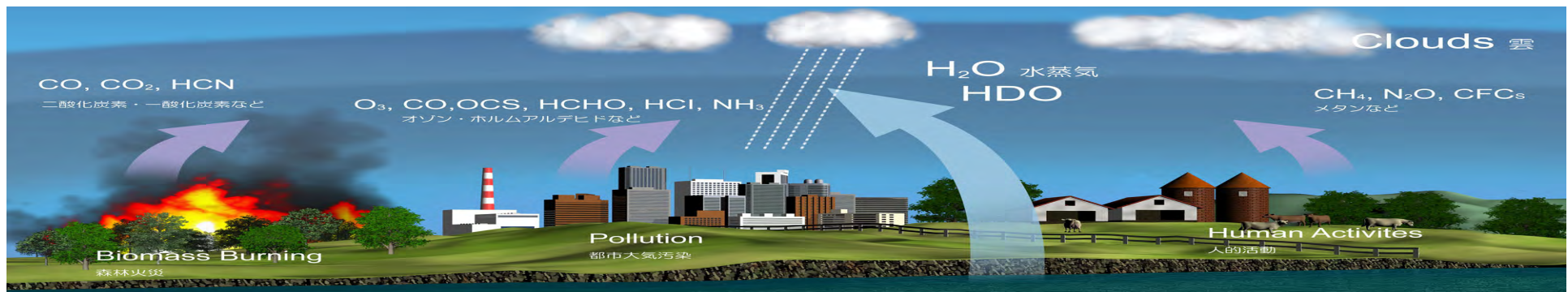
# APOLLO-ISS Mission

Air Pollution Observation from International Space Station



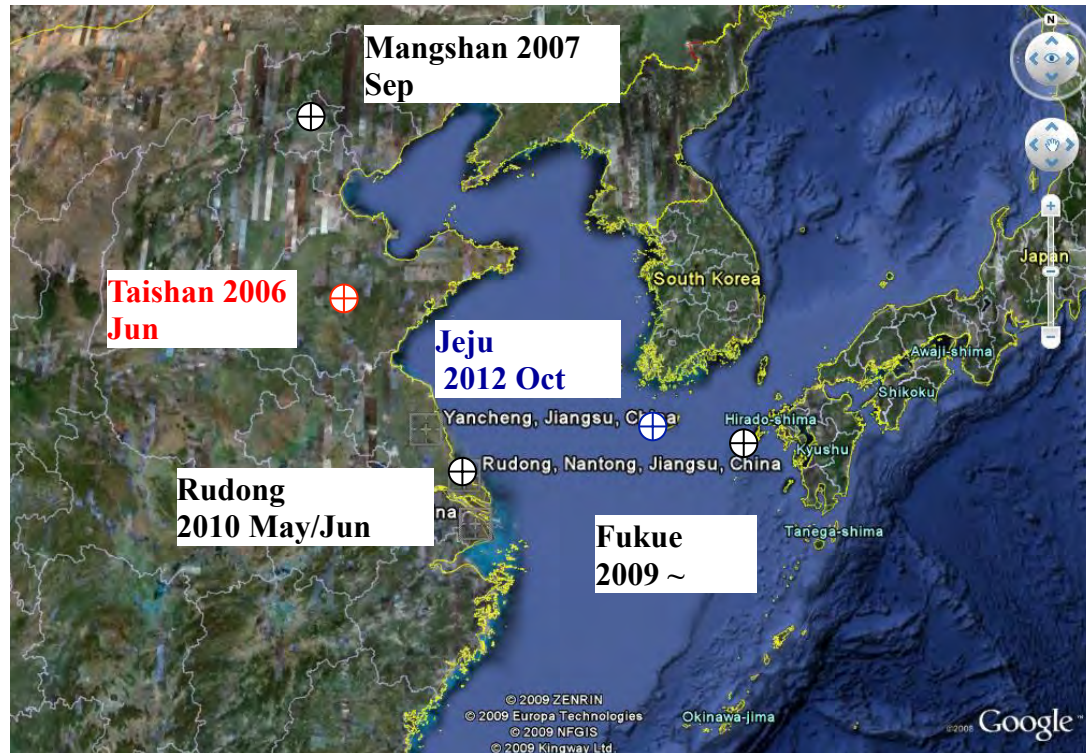
With synergy retrieval of full spectrum range (UV/VIS, TIR, MW), APOLLO-ISS will provide very high resolution (1-2 km) of O<sub>3</sub> precursors & enable altitude separation (3 layers) of tropospheric O<sub>3</sub>

Courtesy of Yugo Kanaya, Hiroshi Tanimoto, Yasuko Kasai, Hitoshi Irie, Naoko Saitoh, et al.

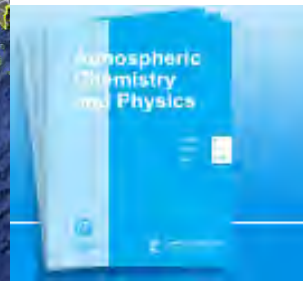




# Field campaigns of O<sub>3</sub>/PM in China



Collaboration with Prof. Zifa Wang (IAP/CAS)

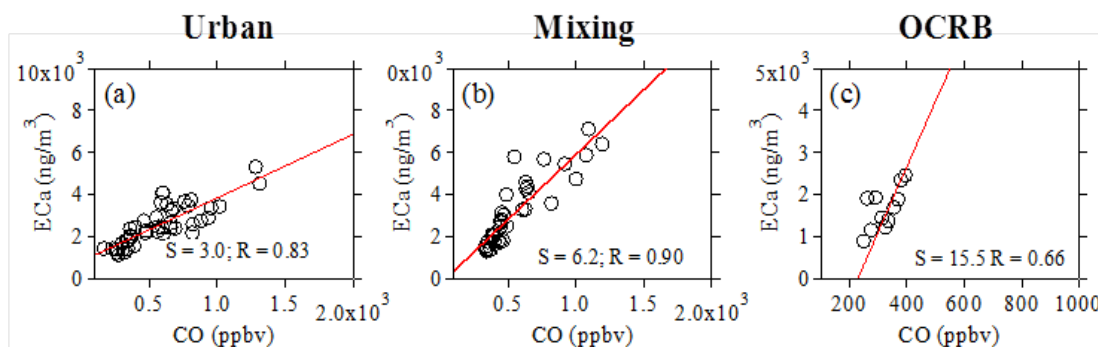


**ACP special issue:**

**The Mount Tai Experiment 2006 (MTX2006):** regional ozone photochemistry and aerosol studies in Central East China

Editor(s): F. J. Dentener, S. C. Liu, and L. T. Molina

Courtesy of Yugo Kanaya, JAMSTEC

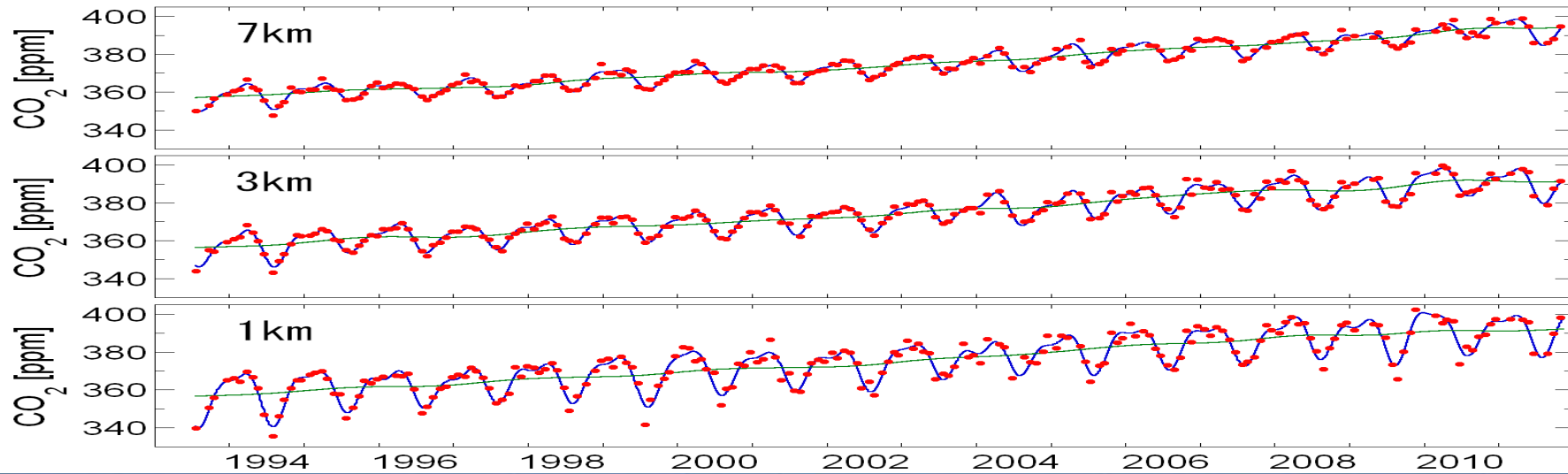


emission ratios from OCRB

Pan et al., in revision, JGR, 2012



# Monitoring of GHGs over Siberia



Courtesy of Toshinobu Machida, NIES

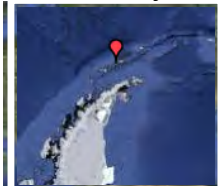


# AsiaFlux: a regional network in FLUXNET

Nobuko Saigusa  
National Institute for Environmental Studies

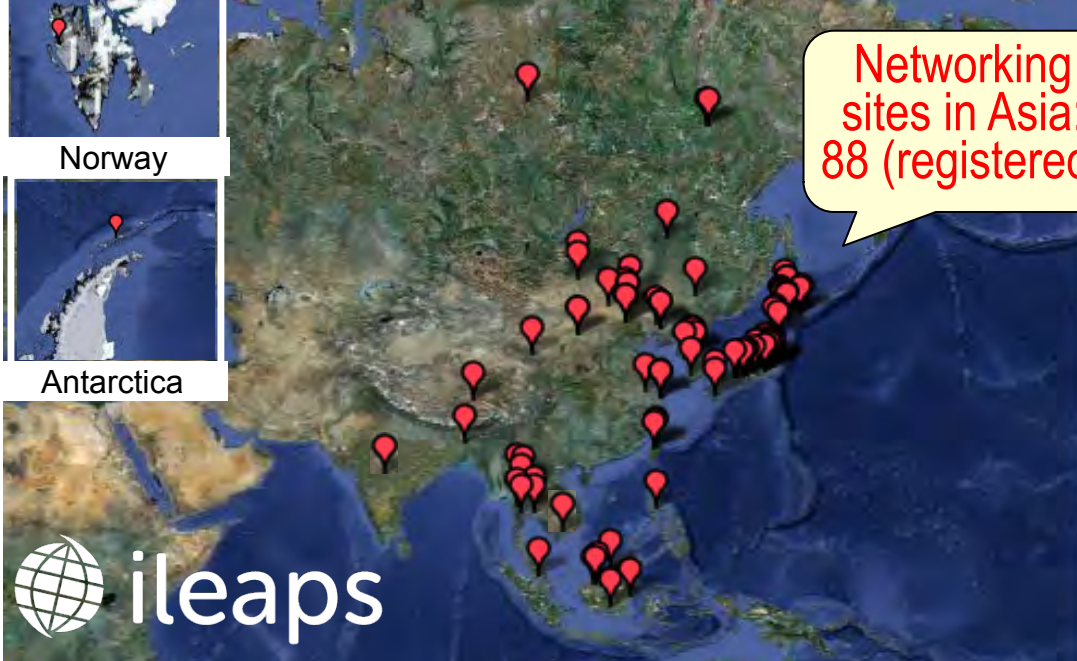


Norway



Antarctica

Location of AsiaFlux sites (<http://asiaflux.net/>)



Networking sites in Asia: 88 (registered)

10<sup>th</sup> AsiaFlux Workshop “Bridging Ecosystem Science and Stewardship” (Johor Bahru, Malaysia, Nov. 2011)



Networking researchers in SE Asia

Host: Univ. Technology Malaysia

AsiaFlux Chair: Kim J (KR)  
Vice-chairs: Miyata A (JP), Li SG (CN)

Joint Workshop “Data-Model Synthesis” (Tokyo, Feb. 2011)



Leading synthesis studies

Training new sites and next generations



Dec 19-21, 2012  
Kuching, Sarawak Malaysia

AsiaFlux short training seminar on data analysis for the eddy covariance method

Capacity building

Top Page

Application Form

# Estimating carbon budget in various ecosystems

Deciduous  
Conifer  
(Larch)

Total photosynthesis (GPP)  
Total Respiration (RE)  
Net CO<sub>2</sub> Exchange (NEE)  
(negative: uptake)

Mixed  
Evergreen &  
Deciduous

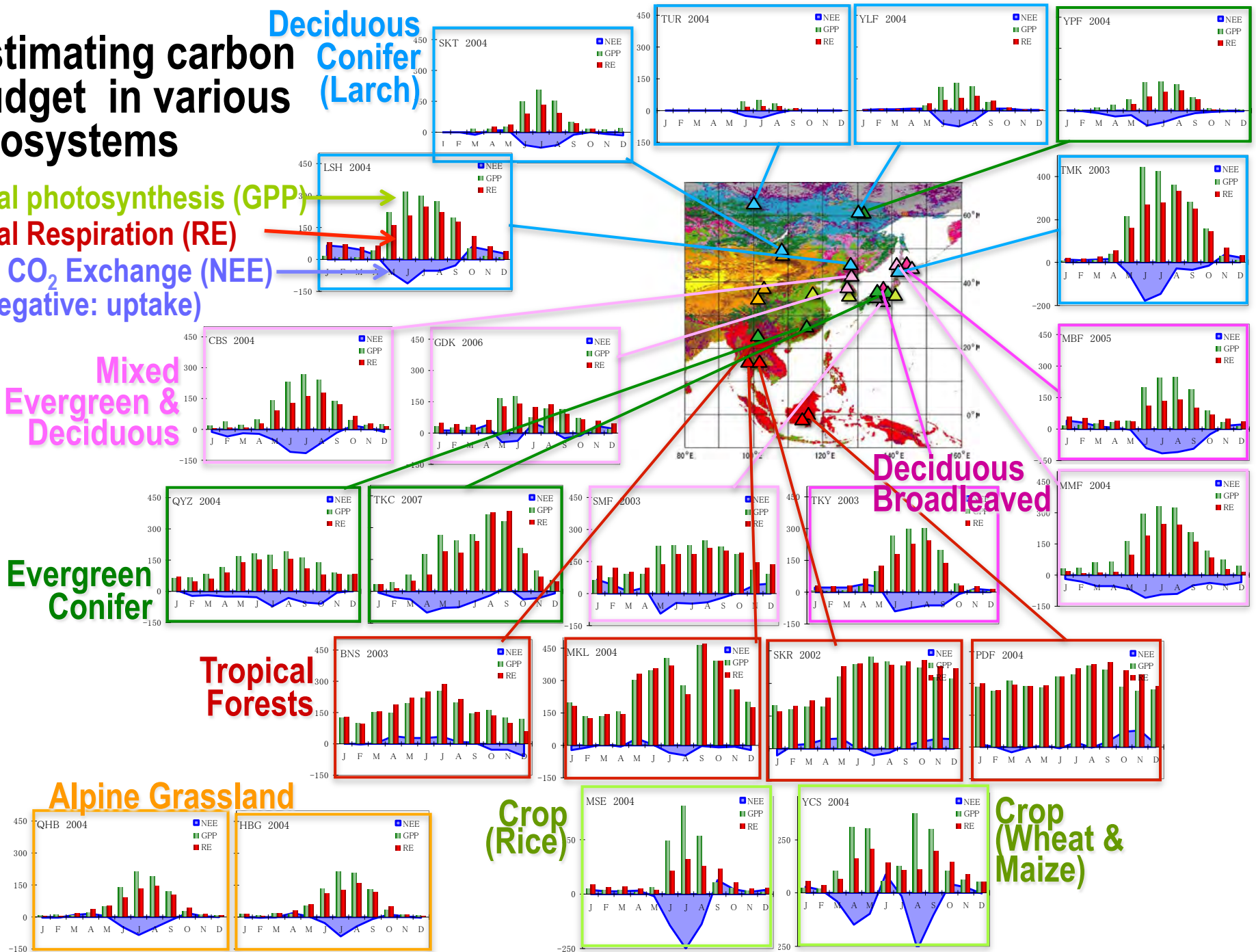
Evergreen  
Conifer

Tropical  
Forests

Alpine Grassland

Crop  
(Rice)

Crop  
(Wheat &  
Maize)



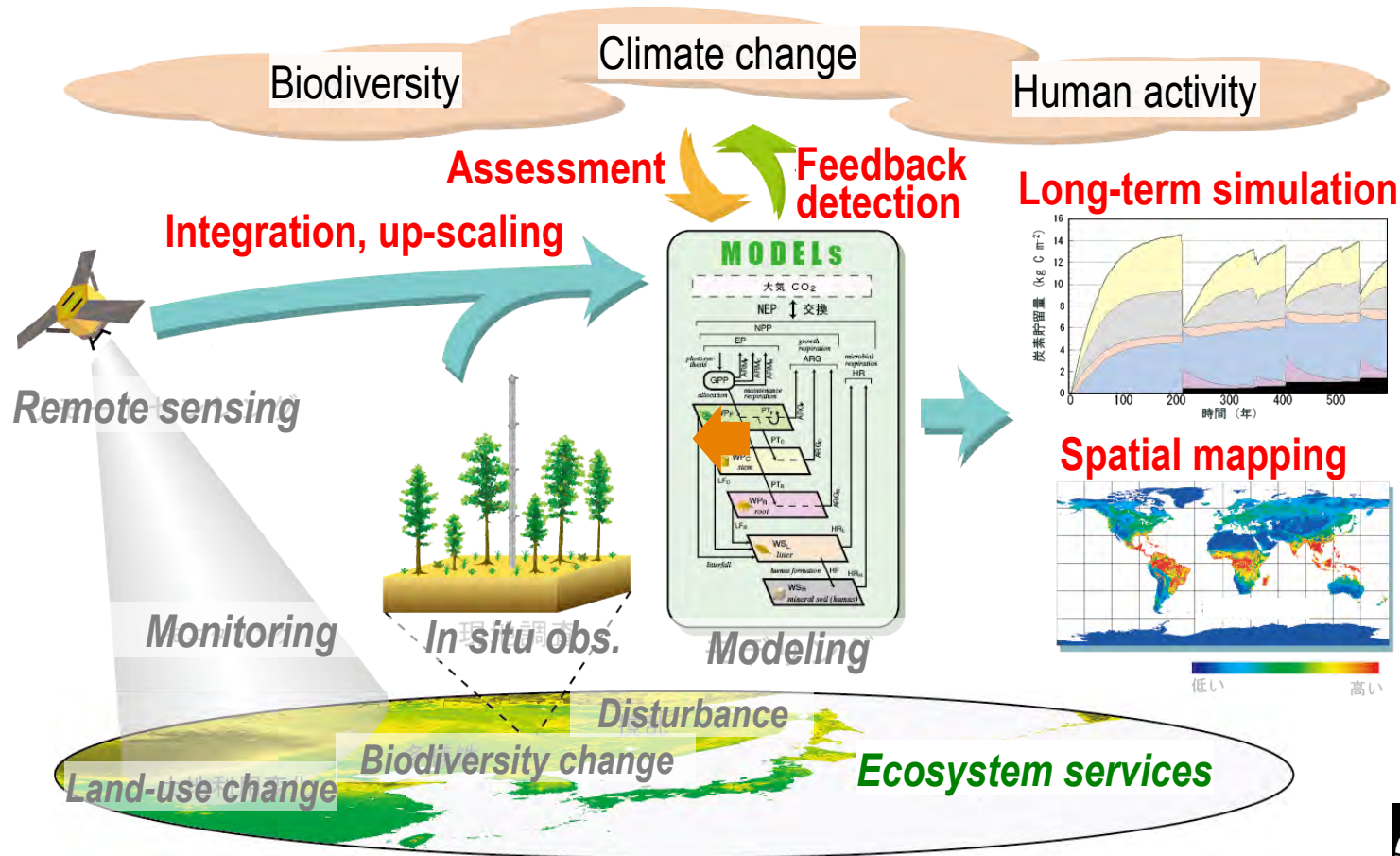


# Modeling Ecosystem Services

Akihiko Ito

National Institute for Environmental Studies

## Development of evaluation method of Ecosystem Services in Asia



*Integrating In situ observations, remote sensing, and terrestrial ecosystem models to estimate current and future ecosystem services in Asia*



*To find a good balance between climate change prevention and biodiversity conservation, particularly in REDD (SE Asia)*



# Adaptation to the changes in Siberia

Tetsuya Hiyama  
Research Institute for Humanity and Nature



## Global Warming and the Human-Nature Dimension in Siberia: Social Adaptation to the Changes of the Terrestrial Ecosystem, with an Emphasis on Water Environments

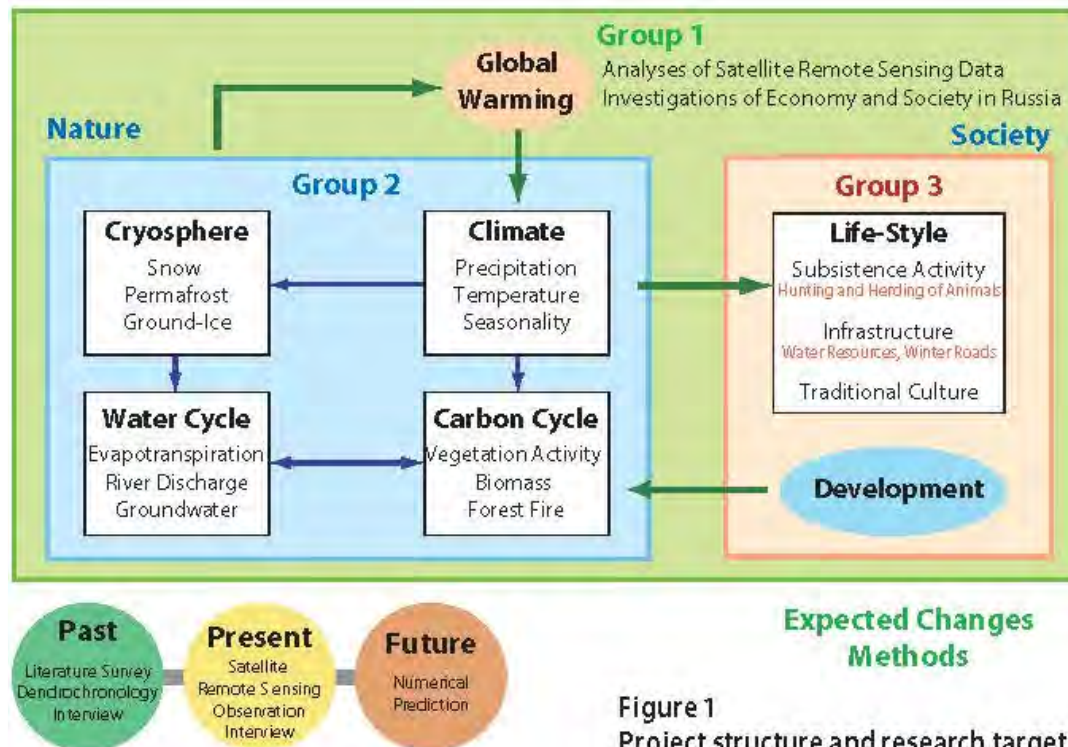
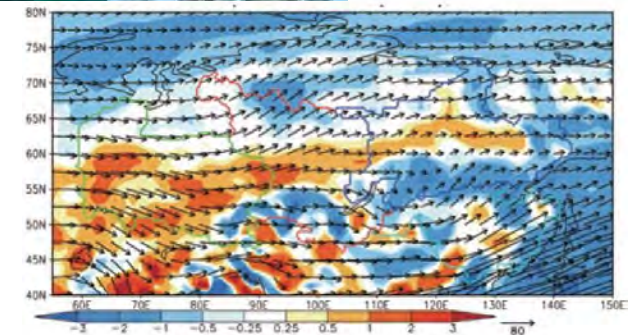


Figure 1  
Project structure and research targets



Atmospheric water circulation in Summer



Number of domestic reindeer in Sakha Repub.



## **Global Land Project (GLP) in Asia**

- Nodal Office
- Endorsed research projects
- Science meetings and symposiums



# GLP Sapporo Nodal Office in Hokkaido University, Japan

<http://www.fsc.hokudai.ac.jp/GLP/>

Global LAND Project

ESSP DIVERSITAS IGBP IHDP WCRP

ENGLISH / JAPANESE

Search

**Sapporo Nodal Office**  
of the Global Land Project

About Us | Resources | Contact Us | Useful Links

The Sapporo Nodal Office assists GLP International Project Office (IPO), located in Instituto Nacional de Pesquisas Espaciais (INPE), in Brazil, in promoting and coordinating research on Vulnerability, Resilience, and Sustainability of Land Systems.  
The Sapporo Nodal Office is based in Field Science Center for Northern Biosphere in Hokkaido University, Japan.

**Objective 1:**  
To identify the causal processes of land system vulnerability

**Objective 2:**  
To identify the quality of coping capacity linked to different perturbations

**Objective 3:**  
To assess the role of governance in bolstering land system resilience

**Information** [View All](#) [RSS Feed](#)

**Call for Sessions; Global Land Project 2nd Open Science meeting**  
Oct 24, 2012 [\[Event\]](#)  
2014 GLOBAL LAND PROJECT OPEN SCIENCE MEETING Land transformations: between global challenges and l... [\[Read More\]](#)

- ✓ Science promotions
- ✓ Network facilitations
- ✓ Publications
- ✓ Capacity buildings



## Taipei Nodal Office, Taiwan



Nature of social-ecological linkages and their implications for the resilience of land systems at various scales

Resilience of land systems at various scales

# Three GLP nodal offices in Asia

## Sapporo Nodal Office, Japan



Vulnerability, resilience and sustainability of land systems

ab

## Beijinn Nodal Office, China

**Beijing Nodal Office**

Institute of Geographic Sciences and Natural Resources Research, CAS



Land use and ecosystem interactions



# The GLP endorsed research projects in Asia

(On-going and completed)

- **Collapse and Restoration of Ecosystem Networks with Human Activity** (Southeast and Central Asia). PI: Norio Yamamura (RIHN, Japan)
- **Expansion of rubber and its implications for water and carbon dynamics in Montane Mainland Southeast Asia**. PI: Jefferson Fox (East-West Center, USA)
- **Fire-Land-Atmosphere Modeling and Evaluation for Southeast Asia** (FLAMES) Project. PI: Darla Munroe (Ohio State Univ., USA)
- **Sustainability of Rainfed Agriculture in India**: Evaluation of Watershed Development Projects in Rainfed Agro-ecological regions in Peninsular India. PI: Kaushalya Ramachandran (CRIDA – ICAR, India)
- **Sustainable Aquaculture Project** (Taiwan). PI: Kang-tsung Chang (National Taiwan Univ., Taiwan)
- **Wild Fire and Carbon Management in Peat Forest in Indonesia**. PI: Noriyuki Tanaka (Hokkaido Univ. Japan)
- **Environmental Valuation** Project (Japan). PI: Tatsuki Sekino (RIHN, Japan)
- **Human activities in Northeastern Asia and their impact on the biological productivity in North Pacific Ocean** (Amur-Okhotsk Project) (China, Russia, Japan). PI: Takayuki Shiraiwa (RIHN, Japan)







Japan Geoscience Union International Session  
**Global Land Project**  
 Makuhari Messe, 21 May 2012, 9:00-12:15



**Programme**

- Opening... *Yukio Himiyama\* (Hokkaido University of Education)*
- SLUAS and the Great East Japan Earthquake Disaster... *Yukio Himiyama\* (Hokkaido Univ of Education)*
- Natural Disaster Triggered by Land Use Change on the Former River Course...  
 ... *Shigeko Hanyama (Mie Univ)*
- Land Use/Cover Changes in  
 ... *Ernan Rustiadi (Bogor Agr Univ)*
- Recent Regional Changes in  
 ... *Haruhiko Dai (Oita Univ)*
- Climate Change and Change  
 ... *R. B. Singh (Delhi Univ)*
- The Relationship between O  
 ... *Feifa Cui (Chiba Univ)*
- Land Degradation in the Ala  
 ... *Jie Liu (Hokkaido Univ)*
- Evaluating Human Impacts  
 Functions in East Asia from  
 ... *Masae Ishihara (Hokkaido Univ)*
- Land Use Scenarios for Eval  
 A Case Study in the Kushi  
 ... *Kikuko Shoyama (NIES)*
- Discussion on GLP... *Yukio H*
- Closing... *Shigeko Hanyama*
- <Poster Session> (Convent  
 Parameter Selection and Its  
 Emissions from Asian Trop  
 Model... *Risa Nomura (Hokkaido Univ)*

# International science meetings organized by the GLP in Asia



Home | Registration | Abstract Submission | Committee | Supporting Organizations | Field Excursion | Information to Participants (28 Oct.)



International Symposium 'Changing Mountain Environments in Asia'  
 Tribhuvan University (TU) and Hokkaido University (HU)

Theme:  
 'Changing Mountain Environments in Asia'

**Major focuses:**

- 1) **Vulnerability, resilience and sustainability of land system in Asian mountains:**  
 This symposium aims to improve our understanding of the critical pathways of change in the land system, how vulnerability and resilience of the land system vary in response to changes in human-environment interactions, and how different institutions influence decision-making and governance for land system sustainability. The agenda includes land use/land cover change, dynamics of land system, consequences of land system changes, and integrated analysis and modeling for land sustainability.
- 2) **Changing mountain environments in Asia:**  
 This symposium discusses the state-of-the-art knowledge and progress of research after the International Year of Mountains (IYM) on mountain hazards from the Middle Mountain landslide to high alpine GLOF, climate change and adaptation, tourism and livelihood, biodiversity, and nature conservation in Asian mountains.

Tribhuvan University and Hokkaido University organized a symposium on mountain environments focusing on the Himalaya in 2000. This symposium is a continuous effort to understand the changes of mountain environments, broadening the coverage to Asian mountains even at global scale. The focus of the area is Asian mountains, but this symposium does not limit the areal

**Contact Address**

Questions about pre-papers, and others to info@2012mountains  
 Watanabe & Narendr  
 Logistical questions travel, accomodati  
 dj.regmi@gmail.com  
 Himalayan Research  
 Logistics of this symp  
 professionally manag  
 Himalayan Research  
 Dhananjay Regmi,  
 http://nimalayansesa

**Organizers**

» Hokkaido Univ



## Community organizing for prosperous future

Environmental issues, rural development, post-disaster reconstruction in South East Asia

**Date & Venue: 18th Oct. 18:00-20:00**

**Clark Memorial Student Center Hall,  
 Hokkaido University  
 (NB W8 Kita-ku, Sapporo)**

How can we solve various issues such as natural disasters, and environmental and social issues that we are facing today? Local communities have been organized to solve various problems by the local people themselves in South East Asia.

Mr. Jo Hann Tan will share his experience as a community organizer working with people who are facing issues of natural disaster, industrial waste and rural development in Malaysia, Indonesia, and Cambodia. He will also talk about the role and activities of community organizers in South East Asia. We will discuss about the potential of community organizing in Japan. (In English with Japanese translation)

**Community organizer**  
 Community organizing is a process people in a community view together into an organization that acts in their shared self-interest. Community organizing is a collaborative help and pressure to achieve. CO has concrete and reproducible vision for local people to change their reality of their lives.

**Jo Hann Tan**

A community organizer, He founded the SEA Popular Communications Programme (SEAPOP) in 1991, a regional network of social development organizations in different SEA countries. He is also the founder of PUSAT FOMAS (1993) a popular communication media organization in Malaysia. In 2008, he was appointed a local coordinator in the Subang Jaya Municipal Council (MPSJ) and he served 3 terms until March 2012. He has been invited as consultant and trainer on developing community organizing in different Asian countries.

Contact: GLP Sapporo Node Office  
 Email: info@glp.hokudai.ac.jp TEL: 011 (706) 3851  
 http://www.glp.hokudai.ac.jp



Several Proposals submitted to Belmont Forum and G8  
Research Councils Initiative:

Transformation and resilience on urban coasts (TRUC)

Proposal to Coastal Vulnerability theme by M. Taniguchi



The 5<sup>th</sup> China-Japan-Korea IMBER Symposium



# GLOBAL OCEAN ECOSYSTEM DYNAMICS, INTEGRATED MARINE BIOGEOCHEMISTRY AND ECOSYSTEM RESEARCH

Symposium: 22-24 November 2011  
Training course: 25 November 2011

State Key Laboratory of Estuarine and Coastal Research  
East China Normal University | Shanghai, P.R. China



[http://www.imber.info/sponsored\\_meetings\\_CJK\\_nov2011.html](http://www.imber.info/sponsored_meetings_CJK_nov2011.html)

Image Processed by Korea Ocean Satellite Center





*Clim*ECO<sub>3</sub>

Summer School

23-28 July 2012

Middle East Technical University,  
Ankara, Turkey

surface ocean solas lower atmosphere study  
20|13

## 6th International SOLAS Summer School

23rd August – 2nd September 2013  
Xiamen, China

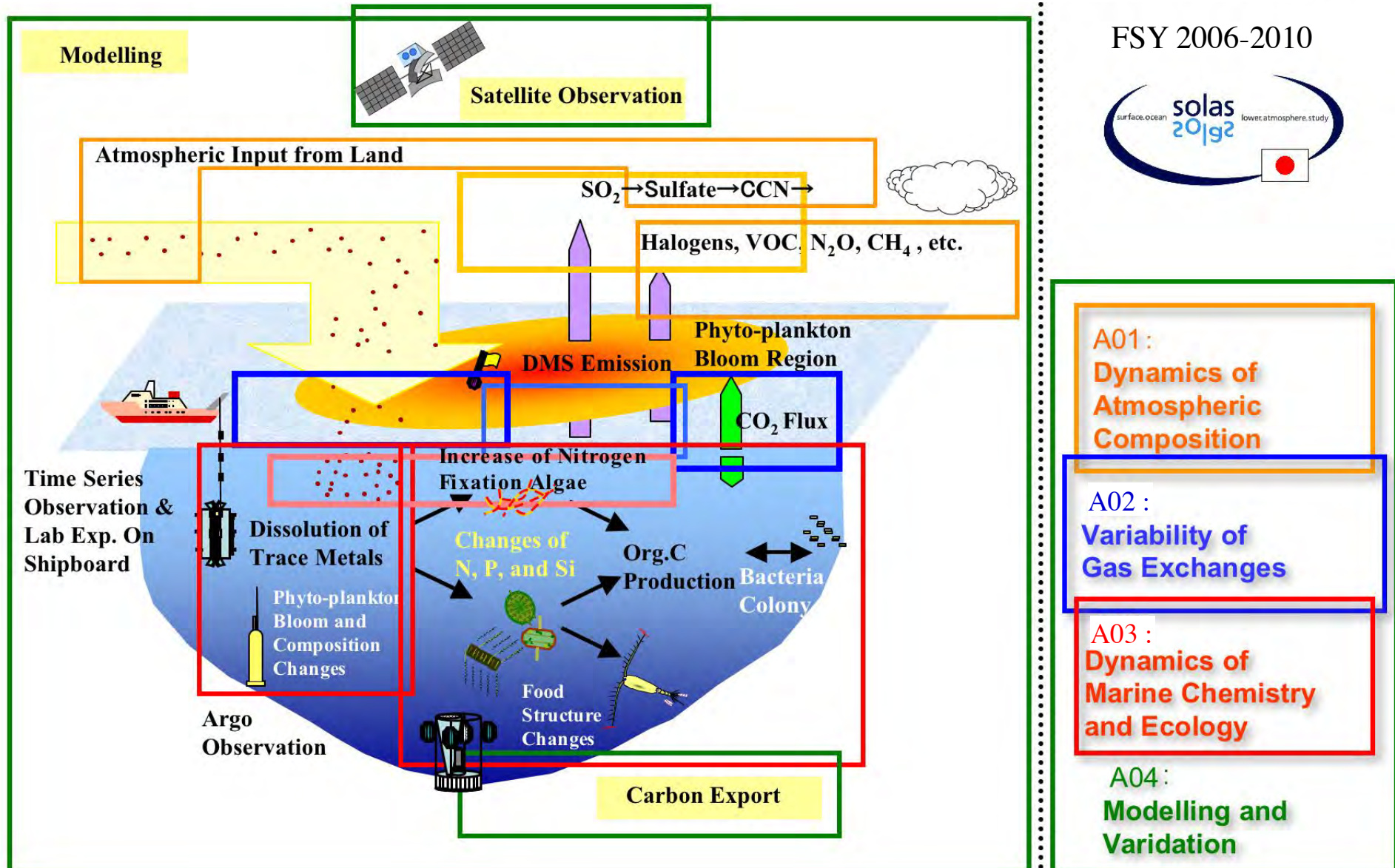


# Grant-in-Aid for Scientific Research on Priority Areas W-PASS (Western Pacific Air-Sea interaction Study)



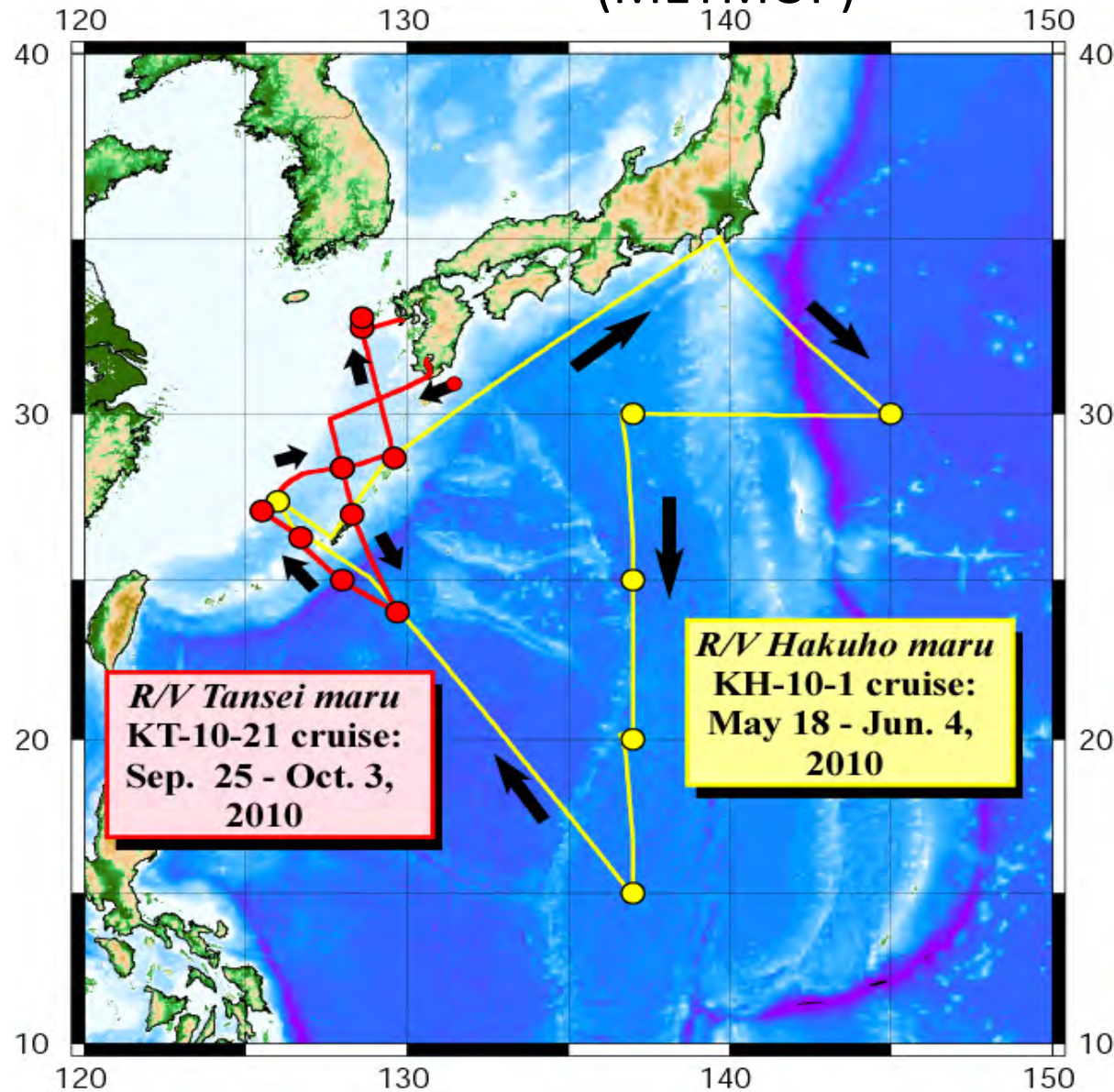
“Linkages in Biogeochemical cycles Between Surface Ocean and Lower Atmosphere”

FSY 2006-2010





# Research Cruises for Asian SOLAS with China, Korea, Thai and Japan Marine Ecosystem Transit from Marginal seas to Open Pacific (METMOP)



# Activities of Asian SOLAS with Workshops on Asian Dust and Ocean EcoSystem (ADOES)

2005:

■ The 1st Asian SOLAS Meeting in Tokyo, Japan, June 1-2

■ The 1st WS on the ADOES in Weihai, China, Oct.14-15

2006:

■ Joint the 2nd WS on the ADOES with Asian SOLAS in Ulanhot, Inner Mongolia, China, Aug.10-15

2007:

■ The 3rd International WS on ADOES in Xianggelila, Yunnan, China, Oct. 24-28

■ 2009:

■ Joint 4th Workshop on ADOES with Asian SOLAS in Je Ju, Korea, October 12-14

■ 2010:

■ Joint 5<sup>th</sup> Workshop on ADOES with Asian SOLAS/WESTPAC/METMOP in Nagasaki, Japan

Nov. 29- Dec. 2, 2010

■ 2011:

■ Joint 6<sup>th</sup> Workshop on ADOES with Asian SOLAS/  
Qingdao, China, October 5- 9







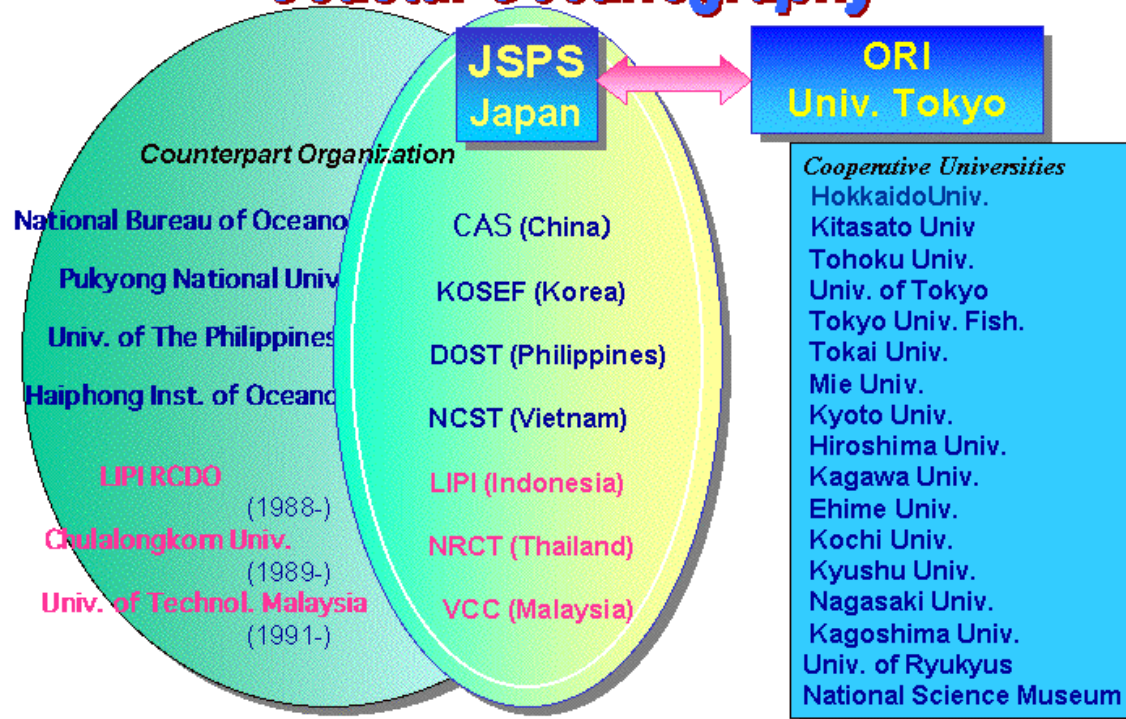
# JSPS Multilateral Cooperative Research Program



## Coastal Oceanography

JSPS Multilateral Cooperative Research Program (2001-2010)

### Coastal Oceanography



### Countries

- Japan (16 Universities and Museums)
- Indonesia
- Malaysia
- Philippines
- Thailand
- Vietnam

### 4 Research Themes:

- Material transport
- Biodiversity
- HAB: Harmful microalgae
- POME: Pollution hazardous chemicals

From <http://www.wdc-jp.com/jsps-cms/>



IOC Sub-Commission for the Western Pacific  
(WESTPAC)





AIMES

PAGES

PAST GLOBAL CHANGES

**Local Action**

**Regional Collaboration**

**Global Connection**