

MAIRS ACTIVITIES & NASA IDS MEKONG WEF NEXUS PROJECT

Jianguo Qi
Michigan State University **and**

MAIRS Science Steering Committee
International Project Office – Beijing,
China
Regional Project Office – Bangalore,
India

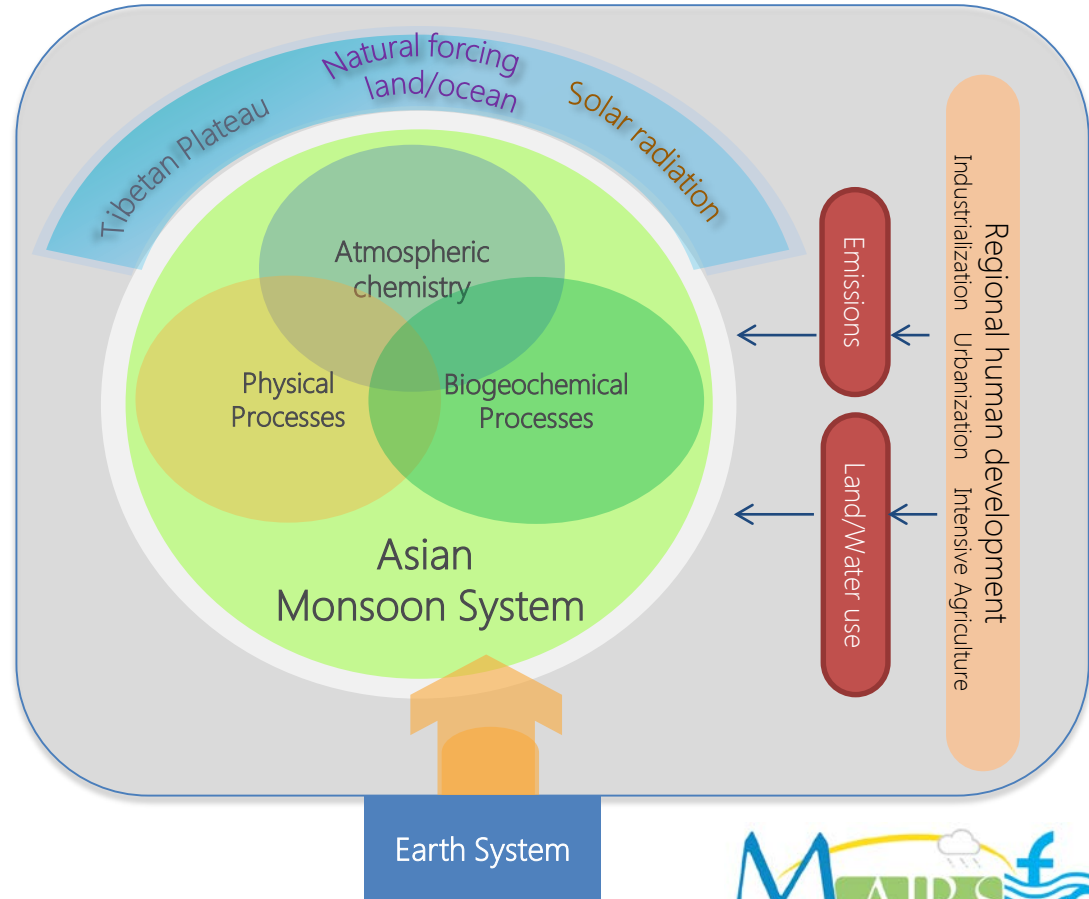
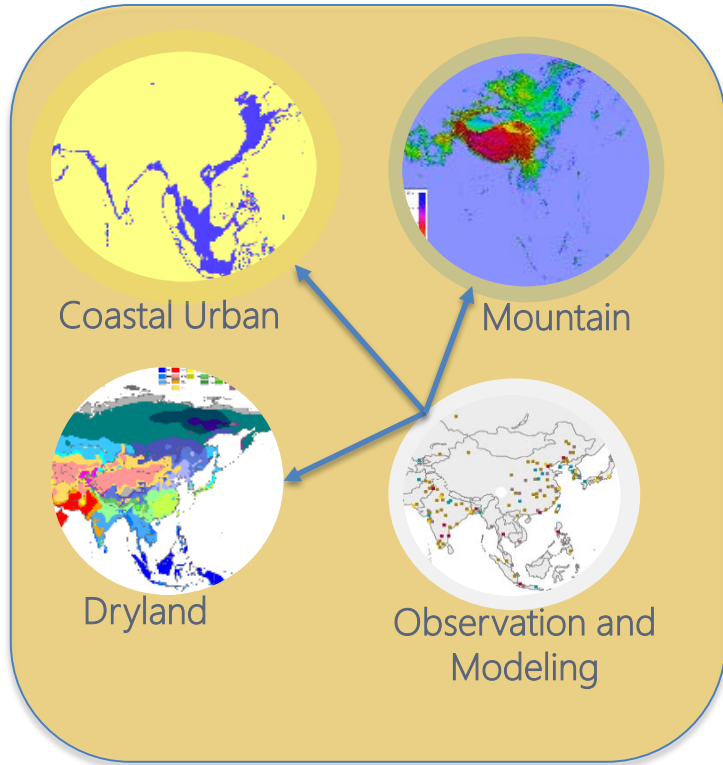
MAIRS: Monsoon Asia Integrated Regional Studies



PRESENTATION OUTLINE

- **MAIRS History**
 - Phase I, II, and III
- **New Priorities**
 - Natural Disaster, Health and WEF Nexus
- **Ongoing and Future Activities**
 - WEF Nexus
 - IDS Project

PHASE I (2005-2010): THEMES & APPROACHES

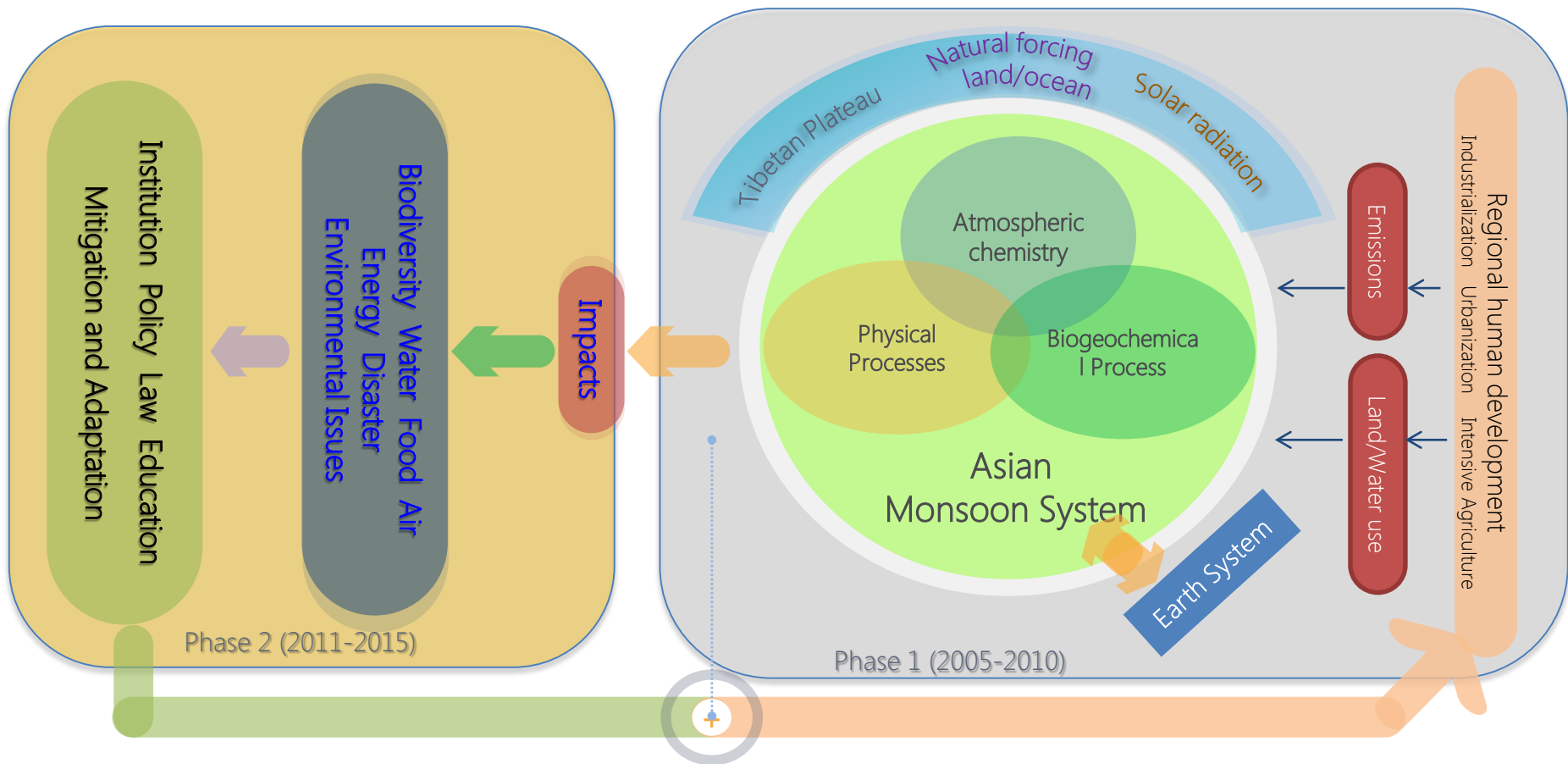


Phase I Conclusions:

- MAIRS was highly valued for international engagements & advanced the earth system science
- Lack of social scientist and stakeholder engagements



PHASE II (2010-2015): FOCUSING ON IMPACTS ON SOCIETY



PHASE II (2010-2015): THEMES AND ACTIVITIES



Scientists involved

More than 200 scientists involved in activities

Workshops

Hosted about 65 international workshops with 2500 participants

Support

Scientists from developing and under-developed countries to attend non-MAIRS conferences and workshops

Training courses

10 young and early career scientist training courses with about 850 participants

Collaborations

14 Chinese key projects funded by MOST, NSFC and CAS, and 43 international projects funded by APN, NASA, JST&JSPS, EU FP7 and AusAID

Promotion

Enhanced collaborations with GEC programs and projects such as CEOP/MAHASRI/AMY, CLIVAR, CORDEX, AMIES, LOICZ, IGAC, iLEAPS, GLP, GCP, GWSP, NEESPI, UNESCO/IHP etc. and established links with many international organizations.

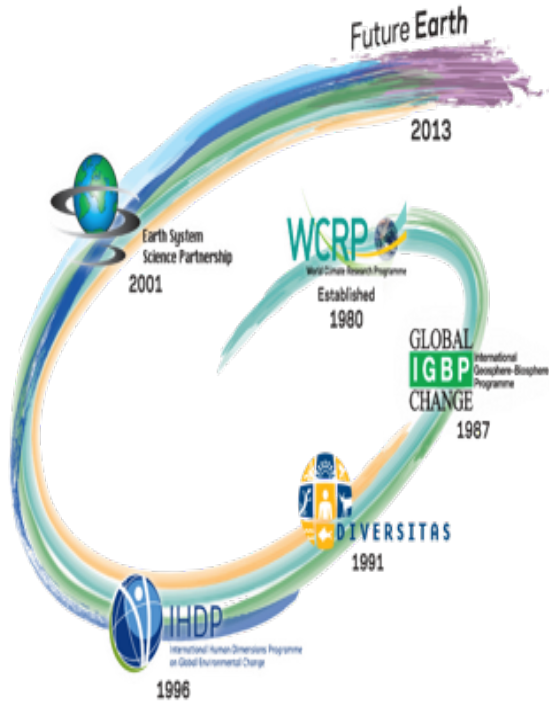


MAIRS Phase II Achievements

- ✓ Focused on cross-cutting global change issues for Monsoon Asia
- ✓ Developed links between research groups across region
- ✓ Established links across disciplines
- ✓ Established links between regional and global research communities
- ✓ Promoted development of Future Earth across Asia

PHASE III: MAIRS → MAIRS-FE

MAIRS: Monsoon Asia Integrated Regional Studies
MAIRS-FE: Monsoon Asia Integrated Research for Sustainability



GLOBAL RESEARCH PROJECTS

KNOWLEDGE-ACTION NETWORKS

SEEDBEDS OF TRANSFORMATION CONFERENCE



Regional stakeholders and institutions

futureearth
research for global sustainability

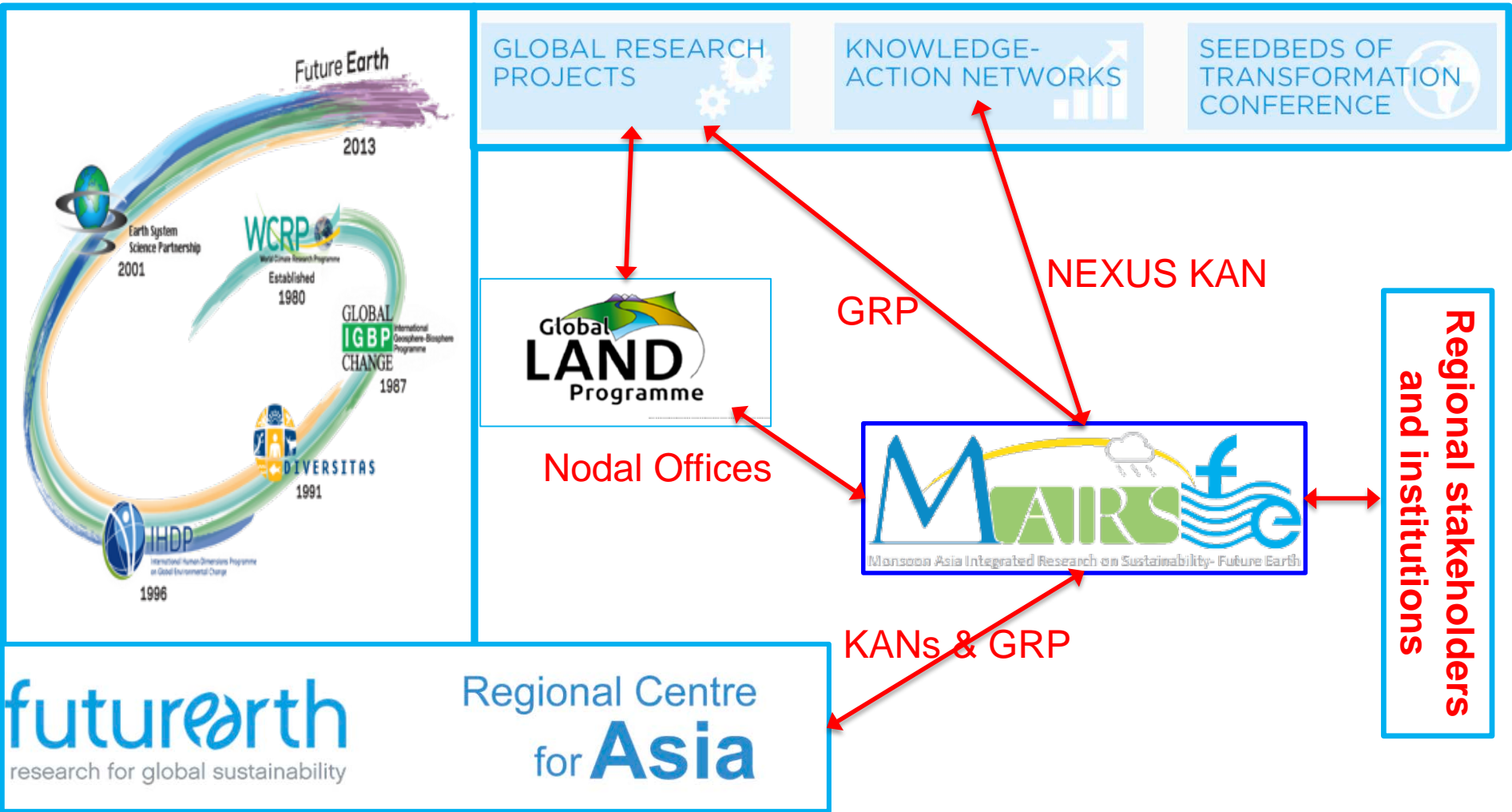
Regional Centre for **Asia**

Nodal Offices

GRP

NEXUS KAN

KANs & GRP



MAIRS-FE VISION

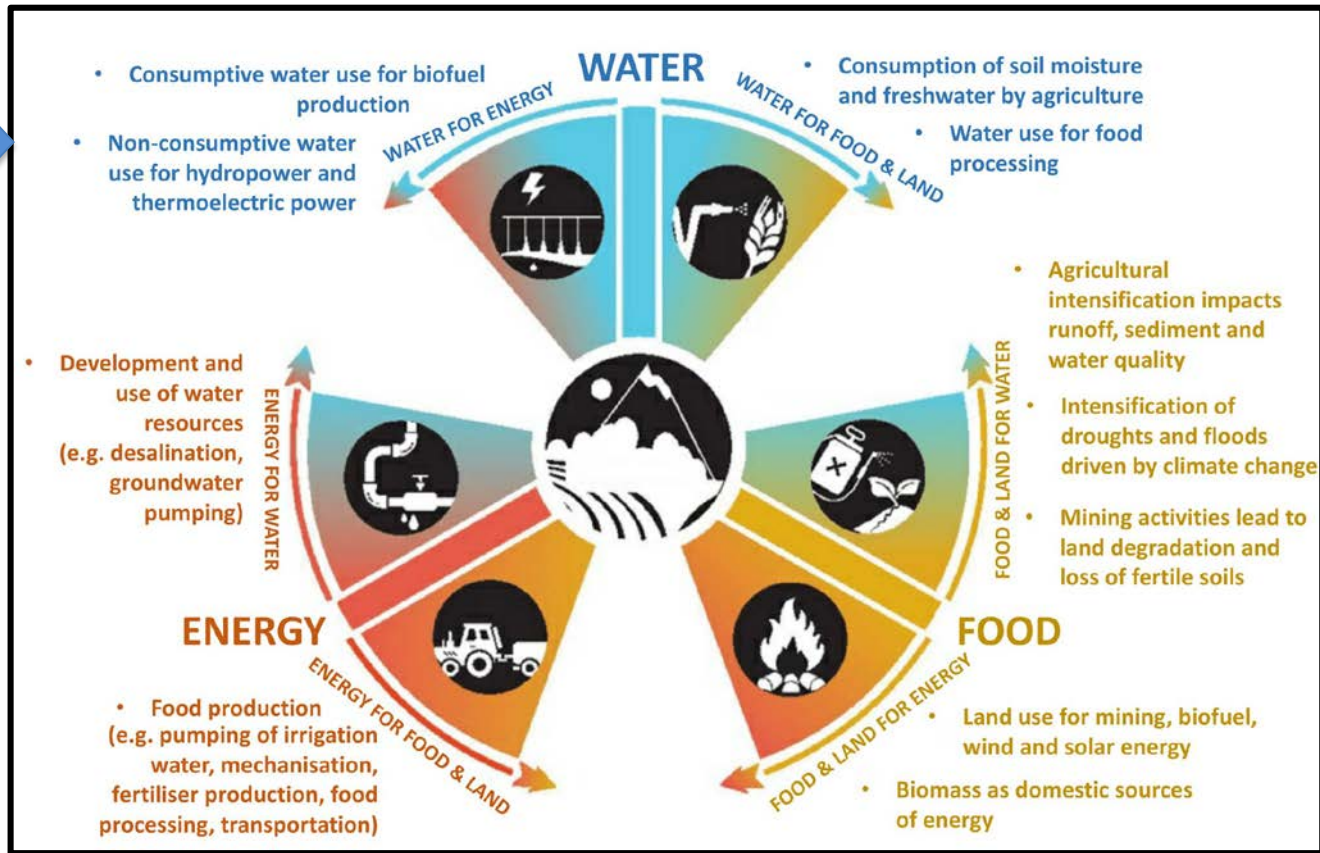
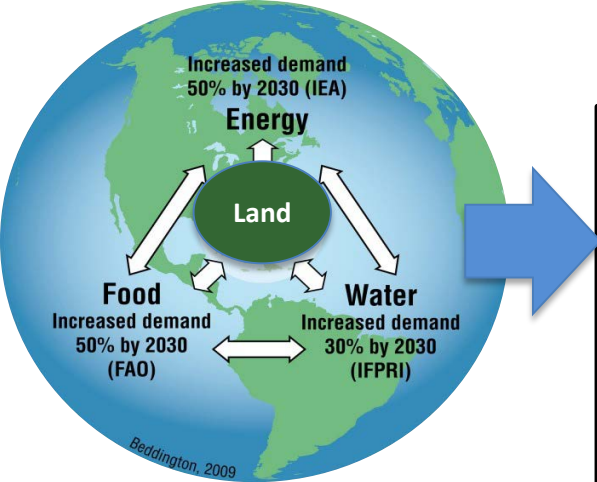
To promote integrated regional studies across Monsoon Asia to

- Enhance the **resilience** of the monsoon system to human activities;
- Reduce the **vulnerability** of human societies to environmental change ;
- Promote collaboration **across disciplines** and regions
- Enhance scientific **capacity** across the region

MAIRS-FE THEMATIC AREAS

- 1. Resilience to climate-related natural disasters**
- 2. Human health in monsoon Asia**
- 3. Water-energy-food Nexus**

NASA IDS Project – Mekong WEF Nexus





NASA IDS PROJECT IN MEKONG

UNDERSTANDING HUMAN AND CLIMATE IMPACTS ON WETLAND ECOSYSTEMS IN THE LOWER MEKONG RIVER BASIN

PI: Jiaguo Qi

US Co investigators:

@MSU: Dan Kramer, David Hyndman, Jinhua Zhao, Joseph Messina, Peilei Fan, William McConnell and Yadu Pokhrel; @AGS: Nathan Torbick and William Salas; @VT: Venkataramana Sridhar

Int'l Partners:

Sura Pattanakit, Mahidol University, Thailand. Apisom Intralawan, Mae Fah Laung University, Thailand. Charlie Navanugraha, Nakhon Phanom University, Thailand. Le Duc Trung, Vietnam National Mekong Committee, Vietnam, Pham Tuan Phan, Mekong River Commission, Laos. Vu Ngoc Ut, Can Tho University, Vietnam. Siam Lawawirojwong, Geoinformatics and Space Technology Development Agency, Thailand. Tep Makathy, Cambodian Institute for Urban Studies, Cambodia. Zaw Naing, Mandalay Technologies, Myanmar. Aiko Endo, Research Institute for Humanity and Nature, Japan. Anik Bhaduri, Sustainable Water Future Programme, Australia. Thongchai Suwonsichon, Kasetsart University, Thailand.



W. McConnell



D. Kramer



D. Hydnman



P. Fan



Y. Pokhrel



J. Zhao



J. Messina



J. Qi



W. Salas



V. Sridhar



N. Torbick



T. Makathy



P. Varnakovida



A. Intralawan



S. Pattanakit



C. Navanugraha



Ho Long Phi



Pham Tuan Phan



Le Duc Trung



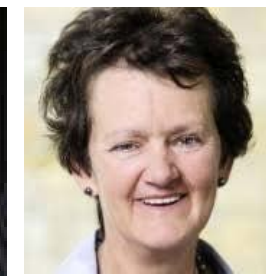
Vu Ngoc Ut



Lisa Robelo



Aiko Endo



Claudia Pahl-Wostl



Anik Bhaduri

LOWER MEKONG RIVER BASIN ISSUES

- COMPETITION FOR DIFFERENT WATER USES
- HYDROPOWER DAMS (MORE THAN 100 DAMS)
- IRRIGATION FOR CROPS
- SIGNIFICANT IMPACTS ON
 - HYDROLOGY, WETLANDS, AGRICULTURE, FISHERIES AND RURAL COMMUNITIES!

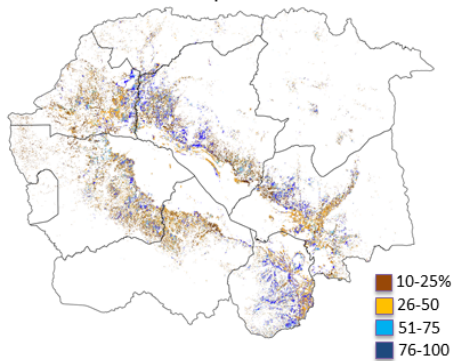


 Selected watersheds

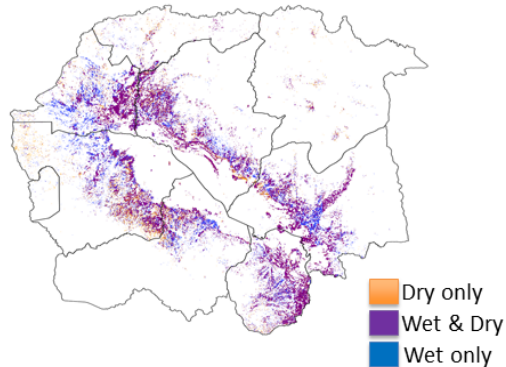
Pak Mun Dam



Time cropland inundated

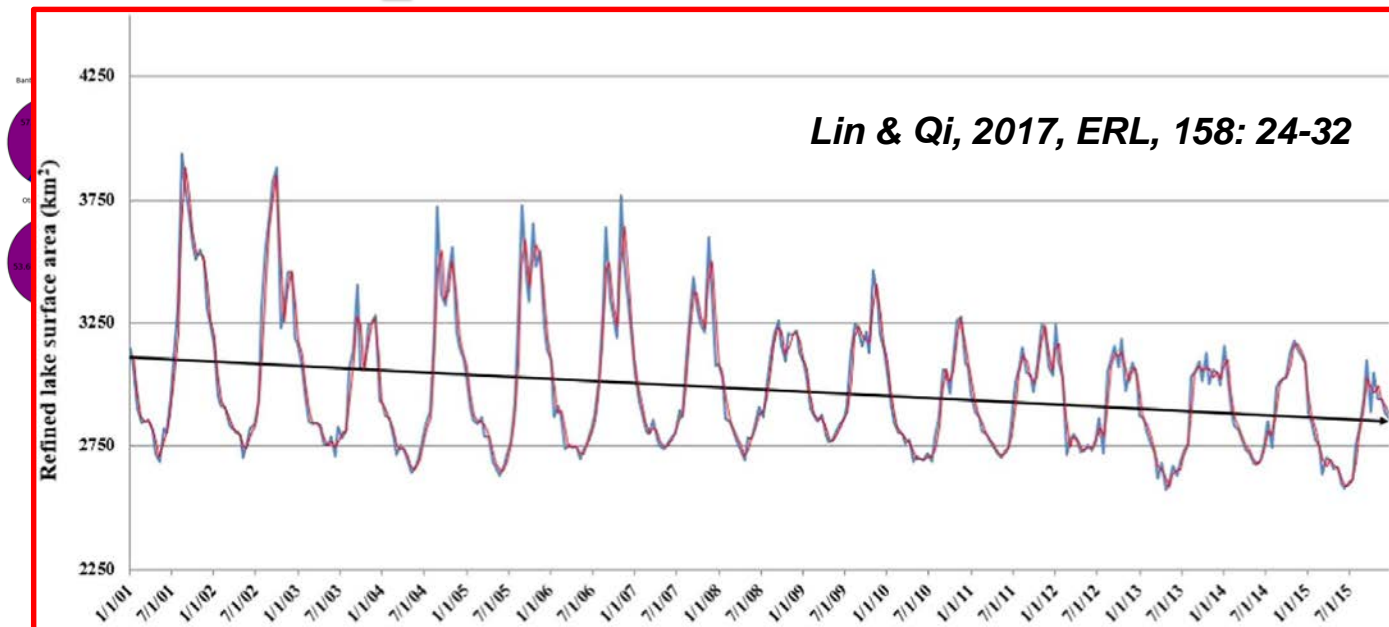
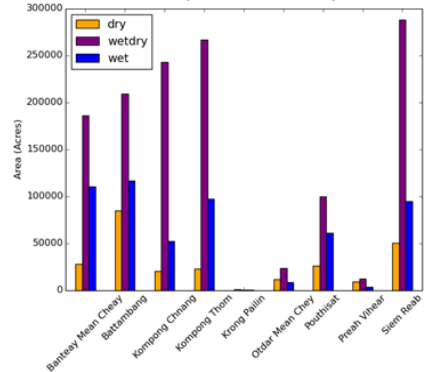


Flood seasons



Tonle Sap Lake

Area of crop inundation by season

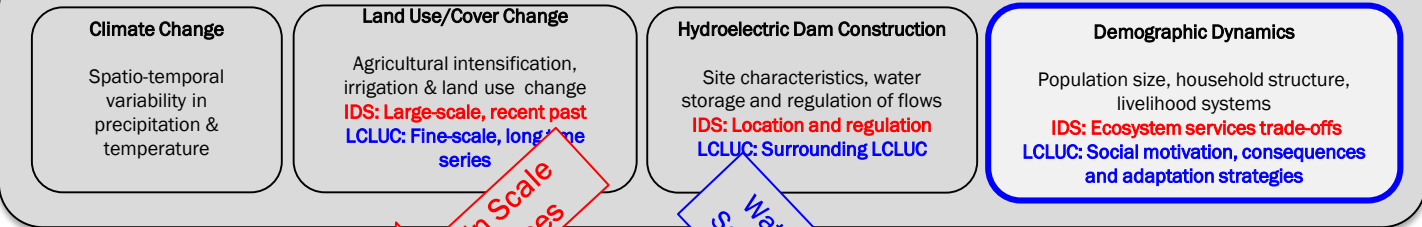


So, OUR PROJECT GOALS

- To improve our understanding of how large-scale human activities (dam infrastructure and associated irrigation) cumulatively affect ecological processes in wetland ecosystems, and to provide a scientific basis for the improved operation of such infrastructure to help mitigate the expected effects of climate change.
- **IDS Element 2: *Ecology at Land/Water Interfaces-Human and Environmental Pressures***

Approach

Drivers of Ecosystems Change (IDS and LCLUC Task 1)



IDS Focus

Basin Scale Analyses

Watershed Scale LCLUC

LCLUC Focus

Hydrological Processes (IDS Task 2)
Spatio-temporal changes in river flow, floodplain inundation dynamics, groundwater, and reservoir storage

Impacts on Lake and Wetland Ecosystems (IDS Task 3)

Lake Phenology and Services Lake phenology, water volume, quality and fish production IDS: Basin scale, coarse resolution	Wetland Ecology and Processes Wetland vegetation, inundation, nutrient retention and greenhouse gas emissions LCLUC: Small watershed scale, fine resolution
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Trade-offs and Governance Options (IDS Task 4)
→ Socio-ecological and socio-economic analyses of ecosystem services provided by coupled dams, irrigated agriculture, wetlands, and lakes and their trade-offs across space and time
→ Basin wide water strategies
IDS: Basin-wide assessment with case studies
LCLUC: Selected rural communities

Ecological Functions and Services (LCLUC Task 2)

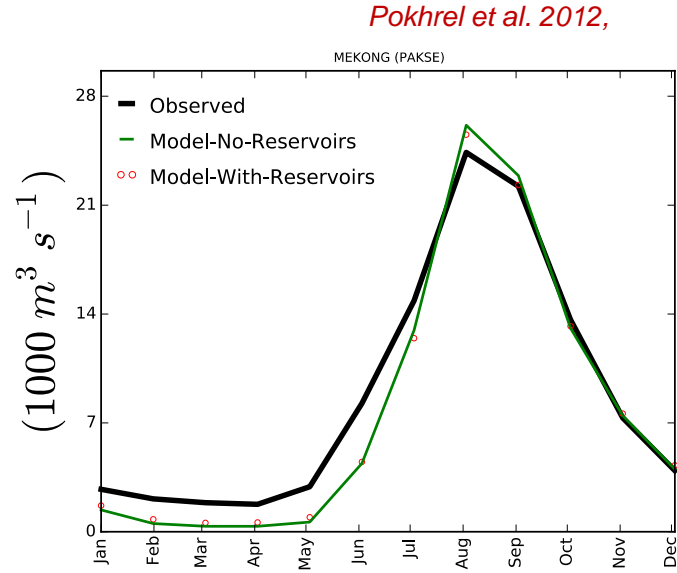
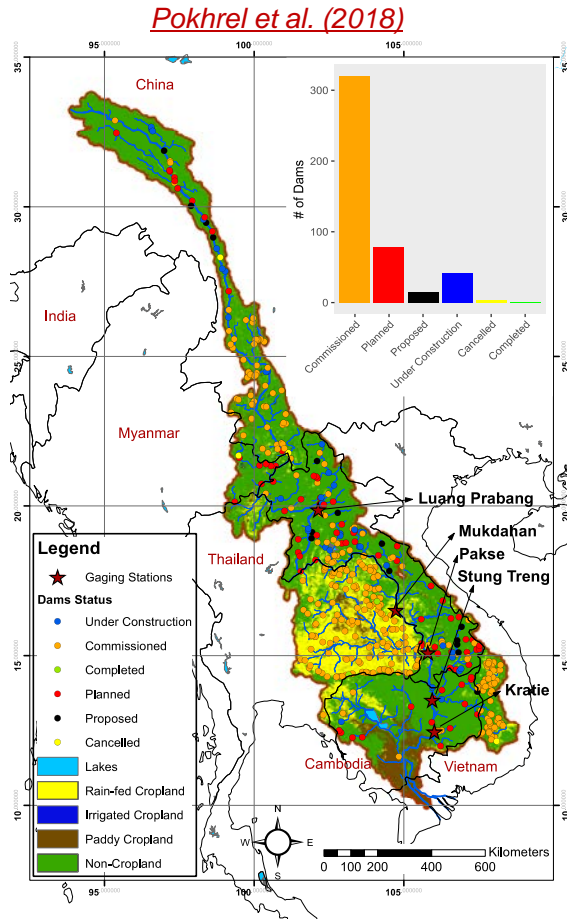
Social Impacts and Responses (LCLUC Task 3)

Social Drivers of LCLUC Local and use attributes and socioeconomic drivers of land use changes
Societal Responses Typology of adaptation and mitigation
Trade-offs and Tipping Points Ecosystem services and human wellbeing across space and time
Synthesis and Strategies Synthesis scenarios, planning, adaptation and future development strategies

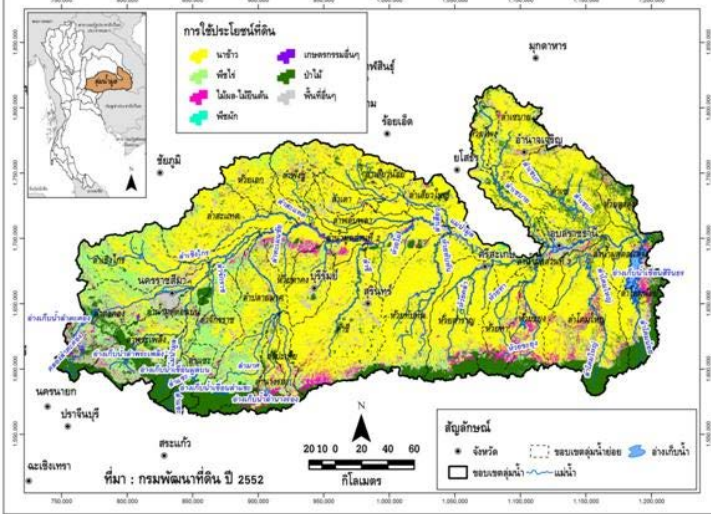
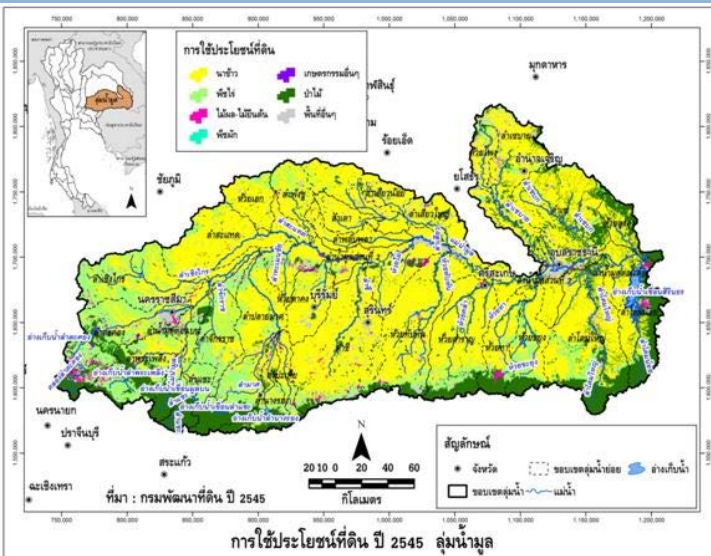
Wetland Dynamics Wetland types, structure, composition, area expansion/shrinking, and rate of change.
Ecosystem Functions Hydroperiod, phenology, thermal regulation and greenhouse gas emissions
Ecosystem Services Cropping potentials, biomass, NPP, and plant biodiversity



DAMS IN THE MEKONG



- ❖ Existing dams do not have significant impact on the flow in the mainstream
- ❖ Impacts on tributaries could be significant
- ❖ Future dams are likely to largely affect the mainstream flow



Land use type	Year 2002 (Km ²)	Year 2009 (Km ²)
Paddy	42,291.86	39,388.49
Vegetable	6.95	98.84
Field crops	10,751.36	8,568.19
Orchard	1,041.24	3,305.58
Other agricultural activities*	79.06	403.97
Forest	11,275.79	10,151.84
Miscellaneous**	5,613.72	9,143.06
Total	71,059.97	71,059.97

* aquaculture, diversified farm, pasture etc.
 ** urban/built up land, water body


Source: Department of Land Development

Mekong researchers seek ways to improve dams

16 Mar 2018 at 14:21  791 viewed  0 comments

From Bangkokpost, March 18, 2018

WRITER: THOMSON REUTERS FOUNDATION



Our team hopes to generate the needed information and knowledge to help develop pathways to improve dams (management)

An international meeting on **ASIA WEF NEXUS & AGRICULTURE**

AUGUST 13-17, 2018

VIENTIANE, LAOS



南京農業大學
NANJING AGRICULTURAL UNIVERSITY



มหาวิทยาลัยนครพนม
NAKHON PHANOM UNIVERSITY



มหาวิทยาลัยเกษตรศาสตร์
Kasetsart University



Mahidol University
Wisdom of the Land



MICHIGAN STATE
UNIVERSITY



Monsoon Asia Integrated Research on Sustainability- Future Earth

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research for global sustainability



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Thank You!

