

RESEARCH ACTIVITIES

Relevant to Global change in Taiwan (China, Taipei)

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Overview

Taiwan is endowed with a variety of natural phenomena. It is a metaphorical "interface", caught between the largest continent and the largest ocean in the world. Our island dutifully watches the annual monsoonal cycle. Typhoons, the Mei-Yu front and cold surges are among the other weather phenomena witnessed. The Eurasian plate also meets the Philippine Sea plate along our east coast, resulting in frequent earthquakes. In the ocean the Kuroshio is the dominant feature. The strong boundary current has been known by fishermen for centuries. The scientists studying high altitude atmosphere, find that our location in a subtropical region leads to some rare observations. The wide array of interesting natural phenomena in Taiwan is enough to keep our scientists busy for many years to come.

That our human resources are sufficient, is a result of scholastic tradition and solid educational system. As an indicator, about 400 scientists with PhDs on meteorology, geology, geophysics and oceanography are actively doing teaching and research in Taiwan. Yet there may be 10 times more Chinese scientists on earth sciences working abroad. Some of them are top-notch researchers. For the past five years the scientific community has been growing rapidly, beyond anybody's expectation.

The government provides adequate funding for basic research. One of the primary goals is to better our knowledge of the environment. The current industrialization process tips the balance of this island's delicate ecosystem. Acid rain, land subsidence and pollution are at the least a nuisance, if not life threatening. The worsening of air, water and soil quality may eventually erode our economical progress.

We have also detected clear signals of the global warming trend in Taiwan. Since 1990, the National Science Council (NSC) has started to organize national global change programmes. We are already involved in IGAC, JGOFS, PAGES, TOGA, and WOCE. It should be noted that as a member of ICSU, Academia Sinica has sent delegates to several IGBP meetings. Only in the past two years, however, did we try to put together a global change programme which will emerge from our effort in the next year or two. We have also set up a Global Change Research Center and plan to put it under the umbrella of the IGBP-START network. The time will come soon for China, Taipei's global change programme to take off.

I. Introduction

It is evident that the effects of human activities have increased so much as to significantly affect climate and the environment on a global scale.

The people and government of the China, Taipei, influenced by the scientific community, are keenly aware of the nature and consequences of this problem. As a result, the "Committee of Geosphere-Biosphere Programme, Academia Sinica, Taipei, for the Scientific Committee for the International Geosphere-Biosphere Programme, International Council of Scientific Unions" was formed in 1988.

Under the National Science Council and the Academia Sinica (AS), various national research initiatives concerning global change research have been developed (see "Organizations involved in Global Change Program of China, Taipei" in the last page). These activities provide a framework for catalyzing and coordinating research among universities, research institutions, government and industrial establishments.

II. International Context

The China, Taipei IGBP Committee is an umbrella organization for China, Taipei contributions to the IGBP Program. NSC has formal relations with the International Group of Funding Agencies (IGFA) for global changes.

At present, we have formally participated in the Joint Global Ocean Flux Study (JGOFS), Past Global Changes (PAGES), and International Global Atmospheric Chemistry Project (IGAC) programs, and have formed respective National Committees. We plan to form a Global Change and Terrestrial Ecosystems (GCTE) National Committee in the near future. Linkage to the World Ocean Circulation Experiment (WOCE) and Tropical Ocean and Global Atmosphere Programme (TOGA) occurs through the China, Taipei WOCE and TOGA Committees.

Direct relations with World Climate Research Program (WCRP) or the Intergovernmental Panel on Climate Change (IPCC) are not established for political reasons.

III. Goals, Structure and Operation of the China, Taipei Global Change Programme

The overall goal of the China, Taipei global change program is to ensure that China, Taipei approach to global change research is cohesive, comprehensive, and responsive to international initiatives, while remaining focused upon regional problems and national needs.

Planning activity has been under way for the last two years under the aegis of the China, Taipei IGBP Committee. Proposition and implementation of research plans were accelerated in the past year due to increase in funding level from NSC, and the successful completion of the first series of Sino-Filipino WOCE cruises and Sino-Russia JGOFS cruises.

The national Committee administrates through a committee of 16 scientists from AS, National Taiwan University (NTU), National Sun Yat-Sen University (NSYSU) and the Central Weather Bureau (CWB). A standing committee of 5 members, including the chairman, is responsible for routine operations.

Working committees of programs related to global change are mostly organized by NSC. These working committees define the nature and scale of global change research activity in specific areas of concern. They also facilitate the development of projects by identifying needs and potential collaboration among different groups. The direction and scope of the China, Taipei national effort in global change are currently defined mostly by scientific projects.

Other government agencies, such as the Environmental Protection Administration (EPA) and CWB also take part in, and fund some global change research programs. Their roles are expected to increase in the future.

IV. Bilateral Relations

Bilateral relations have been established through both formal and informal discussions, meetings and workshops between the China, Taipei committee and the corresponding committees in the US, Japan, France, Russia and the Philippines.

Individual scientists have been involved in planning and discussions for the development of joint scientific projects with scientists from the above mentioned countries and Canada, Germany, Korea, Netherlands and Thailand. Some contacts have been established by individual scientists with scholars of mainland China for data exchange.

V. Results of the Planning Activities

Many existing and planned projects have been identified. They are presented here as established and developing projects.

Established Projects

Title	No. of PIs	Study Period	Budget (Million US\$)	Funding Agencies	Related International Projects
TAIBAR	11	1990-	3.8	NSC, EPA, CWB	IGAC
KEEP	30	1989-1994	6.0	NSC	JGOFS
WOCE	6	1990-96	2.2	NSC	WOCE
PAGES	10	1992-1997	3.0	NSC	PAGES
TOGA	8	1991-1996	1.0	NSC	TOGA-COARE
PEM-west	3	1991-1996	0.1	NSC USA-NSF	IGAC

Developing and Potential Projects

Title	No. of PIs	Funding Agencies	Related International Projects	Status
STIB	15	NSC,	(STIB)	Planning
GCTE	15	NSC	GCTE	Planning
Land-Ocean Interaction		NSC, AS, AEC, EPA	LOICZ	Unorganized
Hydrological Studies		NSC	GEWEX	Unorganized

Note:

AEC: Atomic Energy Council
 GCTE: Global Change and Terrestrial Ecosystems
 IGAC: International Global Atmospheric Chemistry
 JGOFS: Joint Global Ocean Flux Study
 KEEP: Kuroshio Edge Exchange Processes
 LOICZ: Land-Ocean Interactions in the Coastal Zone
 PAGES: Past Global Changes
 PEM-west: Pacific Exploratory Mission-west
 STIB: Stratosphere-Troposphere Interactions and the Biosphere
 TAIBAR: Taiwan Background Atmospheric Research
 TOGA-COARE: Tropical Ocean and Global Atmosphere Programme - Coupled Ocean - Atmosphere Response Experiment
 WOCE: World Ocean Circulation Experiment

Organizations involved in Global Change Research in
Taiwan, China Taipei and their international connections
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