



CliC in the Asian Region

Tetsuo Ohata

Institute for Observational Research for Global Change

Japan Agency for Marine-Earth Science and Technology

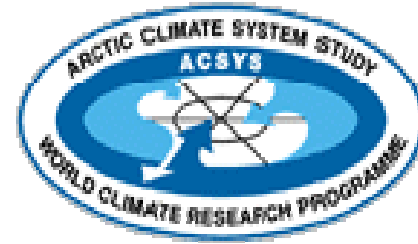


CLIVAR 1995 →



ACSYS/CliC 1994–2003/2000 →

WGNE
WGCM
WGSF



WOCE 1990-2002



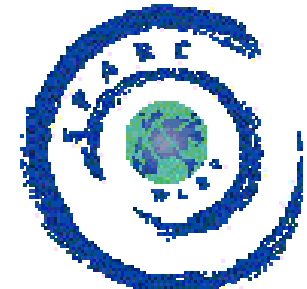
GEWEX 1988 →



SOLAS 2001 ->



SPARC 1992 →



CLIC Goal and Objectives

Principal Goal:

Assess and quantify the impacts that climatic variability and change have on components of the cryosphere and the consequences of these impacts for the climate system, and to determine the stability of the global cryosphere

Supporting Objectives:

- Enhance the **observation & monitoring** of the cryosphere in support of process studies, model evaluation and change detection
- **Improve understanding** of the physical **processes and feedbacks** through which the cryosphere interacts within the climate system
- **Improve the representation** of cryospheric processes **in models** to reduce uncertainties in simulation of climate and predictions of climate change (*role of the cryosphere on predictability of the climate system*)
- Facilitate assessment of changes in the cryosphere and their impact, and to use this information to aid in the **detection of climate change**



Countries Where Cryosphere Occurs

95 countries identified with cryospheric components
Cryosphere truly is global



■ CliC Implementation Strategy

CliC Project Areas

CPA1. Terrestrial cryosphere and hydrometeorology of cold regions (Tatiana Khromova, RB, DK, TO, BG)

CPA2. Glaciers, ice caps and ice sheets, and their relation to sea level (Koni Steffen, JZ)

CPA3. High Latitude oceans and the marine cryosphere (Ian Allison, CM, AW)

CPA4. Linkages between the cryosphere and global climate (John Turner, CM, TF)

Started to hold discussions

1 st Asia CliC Symposium at Yokohama, Japan.

April 20-22, 2006.



The background for regional activities

(1) Many countries are located here in one region, with different observation systems and information, but has common problems and issues.

(2) At least continental or regional view of cryosphere and interaction with environment, is needed to understand the global conditions.

■ Summary of the Symposium

- (1) Date: April 20-22, 2006
- (2) Place: Yokohama Institute, JAMSTEC, Yokohama, Japan
- (3) Participants: 107
- (4) Countries: Canada 1, China 15, India 1, Japan 70, Kazakhstan 1, Mongolia 2, Nepal 1, Pakistan 2, Russia 6, USA 7, Uzbekistan 1
- (5) Presentation: 49 Oral, 42 Poster.

■ Products of the Symposium

- (1) WMO Informal Report
- (2) Proceedings of Extended Abstracts
- (3) Symposium report to Society's publication, CliC News.

■ Topics discussed at the Symposium

- (1) Glacier distribution/changes
- (2) Frozen ground/Permafrost condition and changes
- (3) Snow cover, cold region hydrology and water resources
- (4) Land surface and atmosphere processes in cold region and mountains
- (5) Large-scale cryosphere-atmosphere interactions
- (6) Cryospheric database
- (7) Satellite and ground base observations of cryosphere
- (8) Modeling of cryosphere
- (9) Strategy for future cryospheric research

■ Detail discussions on:

Split session groups

- **Glacier** (Chair: T. Yao, Reporter: K. Fujita)
- Permafrost and frozen ground (Chair: T. Zhang, Reporter: M. Ishikawa)
- **Snow/ hydrology** (Chair: V. Vuglinsky, Reporters: D. Yang and K. Sugiura)
- Cryosphere-atmosphere interaction (Chair: Bian. L, Reporters: R.P. Singh and K. Saito)
- **In situ/ satellite observations** (Chair: H. Enomoto, Reporters: B. Raup and C. Xiao)
- Model (Chair: T. Yamazaki, Reporter: T. Graf)

■ Result of Symposium(1) Common Understanding

The Symposium revealed unique characteristics of the cryosphere in Asia. A high degree of diversity among various cryospheric components was noted. At the same time, it was recognized that climatic forcing influencing the Asian cryosphere, varies considerably within the region, such as monsoon in low latitude and N/AO in high latitude. It makes an interpretation of cryospheric data from the region extremely difficult, especially when cryospheric data is examined in the context of global warming.

■ Result of Symposium(2) Common Understanding

- (1) It was highly visible that an amount of existing data on meteorological, cryospheric, and hydrological variables related to the Asian cryosphere is immense. However, a level of coordination among different researchers and groups is not as yet at an optimal level. This calls for a future action by the community.
- (2) An active involvement in data management and archiving efforts by the Asian CliC community is a priority. Also the necessity of establishing better observation network for present and future, experiments for obtaining higher quality data, application of various models to overcome the spatial/temporal constraints.

■ Result of Symposium (3)

Area of Collaboration (Especially related to water cycle)

- (1) **Water resources:** Snow cover and glaciers are important water resources in quite many area of central and south Asia, and they are reducing strongly.
- (2) **Water and land hazards:** Glacier outburst floods, avalanches, and land hazards related to melting grounds, affects peoples life and the situations are undergoing changes, mainly global warming .
- (3) **Regional climate interactions:** The cryosphere is changing according to interaction with global climate change (global warming, atmospheric contaminats, dust increase), and cryosphere change and influence need to be understood in this context.
- (4) **Experimental Research and data archive:** Joint experimental research, and some kind of data center function.

■ Actions needed, and to be taken

- (1) Need information exchange between Asian countries, on cryosphere/meteorological/hydrological data past and present.
- (2) Common understanding of Asian cryosphere change and impact, through data archive, meetings, usage of satellite remote sensing data and advanced models.
- (3) Establishment of Asia CliC Committee was accepted by the participants, and JAMSTEC showed its responsibility for running the activity and information exchange at least for the time being.
- (4) The Workshops such as “satellite and snow/hydrology” and “atmosphere-cryosphere interaction” were mentioned, and agreed to be held depending on the necessity and availability. 2nd Asia CliC Symposium is scheduled to be held in China in late 2007.

CABIN (tentative) A Program/project Contributing to CliC CPA1

Character: post-GAME project in the Northern Part of Eurasia, including other individual project. Shifting focus point of the study from “process” to “change”, strengthening the atmospheric part and regional data archive.

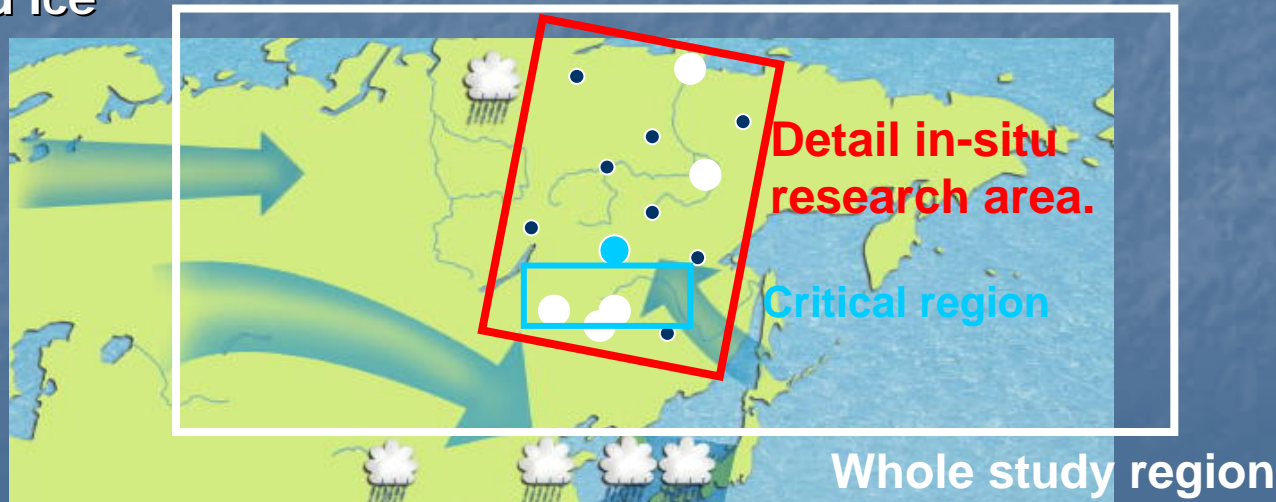
Target Region :Asian part of Northern Eurasia north of 40N.

Central topic: Cryosphere-Atmosphere-Biosphere Interaction and Changes in Northern Eurasia

- (1) Climate change and water cycle
- (2) Atmosphere-land interaction and atmospheric circulation
- (3) Vegetation
- (4) Snow and ice

Presently discussed in Japan by core members

This will have tight relation with CEOP



A landscape photograph of Western Mongolia. In the background, a range of mountains is covered in snow, with some peaks appearing as glaciers. The middle ground shows rolling hills with sparse vegetation, leading down to a large, calm lake. The foreground consists of a grassy slope. The sky is blue with scattered white clouds. The text "Thank you!" is centered over the lake.

Thank you!