

GEWEX HYDROMETEOROLOGY PANEL (GHP)

Reporting Period: 2005/10-2006/12

URL: <http://ecpc.ucsd.edu/projects/ghp/>

Chair and Dates of Term: J. Roads, 2003/01-present

Overview:

GHP coordinates the regional CSEs: the Mackenzie GEWEX Study (MAGS), which has now ended; the GEWEX Americas Prediction Project (GAPP), which is transitioning to the Climate Prediction Program for the Americas (CPPA); the Large-Scale Biosphere-Atmosphere Study in Amazonia (LBA); the La Plata Basin (LPB); the Baltic Sea Experiment (BALTEX); the GEWEX Asian Monsoon Experiment (GAME), which is transitioning to the Monsoon Asian Hydro-Atmospheric Science Research and prediction Initiative (MAHASRI); the Murray Darling Basin (MDB) and the African Monsoon Multidisciplinary Analysis (AMMA), which was approved as a new CSE at the 2005 meeting of the GEWEX Scientific Steering Group. There are also a few global hydrometeorologically relevant projects making contributions to GHP activities and these include the Global Runoff Data Centre (GRDC), the International Satellite Land Surface Climatology Project (ISLSCP), Global Precipitation Climatology Project (GPCC) and the Coordinated Enhanced Observing Period (CEOP). The International Association of Hydrologic Sciences (IAHS) is an organization that provides a forum for publicizing GHP activities. The International Atomic Energy's Water Resources Department was a relatively new global contributor that helped with the SWING working group activities described below. The Hydrologic Ensemble Prediction EXperiment (HEPEX) is planning to become a global contributor to a new Hydrologic Applications Project.

Status:

GHP held its annual meeting in September at the Bureau of Meteorology Research Centre in Melbourne, Australia. The BMRC is the numerical weather prediction center associated with the Murray Darling Basin (MDB) Continental Scale Experiment (CSE). The objective of the meeting was to review the past year's progress and refocus GHP objectives to meet the GEWEX Phase II objectives, which were modified to reflect the recent WCRP strategy for international research and collaboration efforts called the Coordinated Observation and Prediction of the Earth System (COPES). Future GHP activities are being increasingly focused on developing a regional to global hydrometeorological analysis and predictive capability and developing applications of GEWEX science for operational hydrology.

Some of the GHP highlights for the past year include the following:

- The GEWEX Asian Monsoon Experiment (GAME) and Mackenzie GEWEX Study (MAGS) ended this past year.
- A final MAGS report will be presented by Hok Woo at the 2006 pan-GEWEX meeting. No direct follow-on projects are being planned. However many of the MAGS scientists are involved in a network proposal for the IGPY and other scientists are involved in a drought study.
- A follow-on project for GAME, tentatively named MAHASRI, is being planned for 2006-2012 with the objective to improve the prediction of the Asian monsoon and its hydrological cycle. Jun Matsumoto represents MAHASRI.
- Both the Baltic Sea Experiment (BALTEX) and the Large-scale Biosphere Atmosphere Experiment in Amazonia (LBA) have now completed their Phase I activities.
- The BALTEX Phase II science plan has been published and the implementation plan will be completed this year. BALTEX is represented by Hans Jorg Isemer.
- One of the major activities of LBA Phase II will be the Regional Atmospheric Carbon Budget in Amazonia (BARCA), which will address the basin-wide budgets of CO₂, CH₄ and water. LBA is represented by Jose Marengo.
- The La Plata Basin (LPB), represented by Hugo Berbery and Maria Silva Dias, and the Murray Darling Basin, represented by Alan Seed, are continuing to develop their implementation plans.
- GAPP plans to end by 2007 and then continue to contribute as a CSE as part of the Coupled Prediction Project for the Americas (CPPA). Through GAPP, numerous operational model upgrades have improved the Environmental Modeling Center global forecast system. A new CPPA science and implementation plan is being prepared for submission to GEWEX SSG.

- An operational center has been established for the African Monsoon Multidisciplinary Analysis (AMMA) Project. The AMMA implementation plan was presented at the 1st International AMMA Conference on the West African Monsoon held in Dakar, Senegal on 28 November - 2 December 2005 and subsequently at the 2006 GEWEX SSG.
- A presentation on the Northern Eurasian Earth Science Partnership Initiative (NEESPI), an interdisciplinary program that includes the Former Soviet Union, Northern China, Mongolia, and Eastern Europe was given at the 2005 GHP meeting. Development of a NEESPI CSE continues to be encouraged.
- The Data Management (DM) Working Group, chaired by Steve Williams is continuing to focus on CEOP by gathering station data from the CSEs during the CEOP time period. CEOP was able to take advantage of GHP/DM and other GHP activities to launch its globally coordinated effort.
- The Water and Energy Budget Study (WEBS), chaired by John Roads is assessing the uncertainties in observing and simulating water and energy budgets over the CSEs in particular, and global land in general, using model output and GEWEX global data sets.
- The Worldwide Integrated Study of Extremes (WISE) working group, chaired by Ron Stewart is determining the extent to which processes responsible for extremes are similar in different regions, to understand the processes that link extremes in different regions, and to assess how they may be changing. One of the first tasks for WISE is to develop a database of extreme events starting with the CEOP time period and extending back in time.
- The Stable Water Isotope Intercomparison Group (SWING) has almost completed its analysis of the first common SWING simulations under present-day boundary conditions using three different state-of-the-art isotope global circulation models. A change in chairmanship was made from Martin Werner to David Noone this past year.
- The Transferability Working Group (TWG), chaired by E. Takle, is facilitating the development of regional models and climate simulations. Of particular note, is the Inter-CSE Transferability Study (ICTS), a joint project under TWG and CEOP/WESP chaired by Burkhardt Rockel, to study the performance of regional climate models over all of the CSEs. The TWG agreed at the GHP meeting to also participate in the ongoing GEWEX Cloud System Study (GCSS) Pacific Cloud Transect Study. Colin Jones represents the TWG at the GMPP meetings.
- The Water Resources Application Project (WRAP), previously chaired by Lawrence Martz has now changed to a Hydrologic Applications Project (HAP), chaired by Eric Wood. Examples of initiatives with promising links to HAP include HEPEX and the Project for Ungauged Basins (PUBs).

New Directions:

As discussed by Roads et al. (2006) CEOP, which began as a discussion item at the 2nd GHP meeting in 1995, eventually became such a successful working group that it was moved from GHP to become a program that was recognized by WCRP as an element of WCRP initiated by GEWEX. CEOP has been strongly supported by GHP and many GHP activities have now become actively entrained within CEOP, in part through the CEOP data management and modeling activities, and in part through cross linkages of some of the CSEs and GHP science working groups within the CEOP Monsoon Panel (MP) and the Water and Energy Simulation and Prediction panel (WESP). Examples of current WESP activities include a WEBS and an Inter-CSE Transferability Study (ICTS) working group. Examples of cross linkages include the GHP/WISE – CEOP/Extremes working group, which focuses on both midlatitude (WESP) and tropical (MP) hydrometeorological extremes especially during the CEOP time period, which is now being extended past the original 12/31/2004 pilot phase.

Initially, CEOP was looked on as only a pilot experiment, designed to intensively study a limited time period, 7/1/2001-12/31/2004, a period when many CSEs would likely have corresponding intensive observation periods to complement CEOP and a time when many of the new Earth Observing Satellites would be providing a wealth of new information about the earth. This pilot experiment was formulated and guided by a formal Science and Implementation Plan and involved a number of technical and science driven working groups that were reviewed and received direction and oversight from a Science Steering Committee and an Advisory and Oversight Committee. However, with the demonstrated success of CEOP phase I and advent of CEOP phase II, it is clear that CEOP will transition beyond a pilot period and

will be extended for a number of years meaning that researcher time and available grant funds will become increasingly focused on CEOP efforts.

As a result, GEWEX, in full agreement with the GHP, and with CEOP, has decided to merge GHP within CEOP. This formal merger is meant to enhance the efforts of both GHP and CEOP and will not lose sight of any of the GHP goals or any of the ongoing GHP work since the same scientists and more are already working on closely related projects and goals in CEOP. It does mean, however, a refocusing of the CSE and GHP agendas toward the CEOP program.

Future: Next Year Foreseen Activities:

Next year, GHP will have been merged within CEOP. In particular, the CSEs will become a separate panel within CEOP, equivalent in status to the WESP activities and the Monsoon activities. New co-chairman will be named to map out future CEOP/CSE activities. The former GHP working groups will be absorbed within their parallel activities within CEOP. DM has already become the in situ data archive for CEOP. In addition, the model data archive and the satellite data archives arose from previous GHP sponsored activities in GAME and BALTEX. WEBS will continue to function within the CEOP/WESP framework, as will the Transferability Working Group through ICTS. SWING activities will become a new WESP activity. HAP will become part of the CEOP cross-cutting watershed hydrology working group and WISE will consolidate its WISE activities under the CEOP/Extremes working group.

Key Results:

- All of the CSEs have generated hundreds to thousands of scientific studies that have been published in the refereed literature. Links to these publications can be found at the CSE web sites.
- All of the GHP working groups have been encouraged to submit for publication a description of their activities. Of special note this past year is the TWG BAMS article describing initial ICTS results, which were also described in part by a CEOP newsletter article.
- GEWEX NEWS articles describing the GHP DATA centers and GHP WEBS activities were also published this past year.

Issues and Recommendations:

By the end of the pan-GEWEX panel meeting, we will have merged current GHP activities with CEOP activities. Thus there is no longer a need for an independent GHP and this constitutes our final GHP report. However there are still some issues that need attention by the SSG.

Issues for Attention by the SSG:

- All of the beginning CSEs have been encouraged to submit science and implementation plans for approval by the GHP members and GEWEX SSG.
- All of the ending CSEs have been encouraged to submit final reports describing where the CSE data collected will be archived, and where the CSE key results will be published.
- It is no longer clear what the formal requirement should be for a CSE to be recognized as a CEOP CSE. These requirements need to be developed by the new CEOP/CSE working group, which also include semi-arid and cold region projects.
- NEESPI should be encouraged to become a CEOP CSE, perhaps in conjunction with the CEOP cold seasons project.
- Many former GHP global projects will now come under the auspices of the other GEWEX panels. This has already begun to happen, for example, ISLSCP has now finished two highly successful phases and will begin to focus on land flux issues under the GRP. GPCC and GRDC will also report to GRP. HEPEX and IAHS will now report to CEOP through HAP. The GEWEX SSG may want to comment on the new CEOP structure that has evolved with the merger of GHP and CEOP.

Contributions to WCRP strategic framework (including overall strategy on observation, assimilation and modeling and WCRP cross-cutting task teams)

GHP has provided global oversight of the various CSE science activities, observations, and field programs. This oversight is now being transitioned to a new CSE organization within CEOP. In addition,

the former GHP working groups are now part of CEOP and will help CEOP to contribute to the WCRP strategic framework.

Contributions to Society and to WCRP/GEWEX Visibility

CEOP and GRP have become quite visible within the global research community with their connections to the Integrated Global Observing System. Merged GHP activities will contribute to a revitalized CEOP and GRP.

Summary:

Since 1994, the GEWEX Hydrometeorology Panel (GHP) has coordinated the activities of the GEWEX Continental Scale Experiments (CSEs), in part by developing several international working groups to foster water and energy cycle research. These working groups ranged from Data Management, Water and Energy Budget Studies, to Water Resource Applications. The Coordinated Enhanced Observing Period (CEOP), which began as a discussion item at the 2nd GHP meeting in 1995, eventually became such a successful GHP working group that it became a program that was recognized as an element of WCRP initiated by GEWEX. CEOP was strongly supported by GHP and many GHP activities have become actively entrained within CEOP, in part through the CEOP data management and modeling activities, and in part through cross linkages of the CSEs and GHP science working groups with CEOP working groups. Given that CEOP is now being extended past the original 12/31/2004 pilot phase and given the perceived duplication of effort, GHP, in full agreement with GEWEX and CEOP, will become fully absorbed within the CEOP framework and will cease to exist as an independent entity at the end of 2006. Previous science activities fostered by GHP will continue to be fostered within CEOP and GEWEX. In that regard, it should be mentioned that a few of the previously associated global GHP activities, like ISLSCP, GPCC and GRDC, will now come under the umbrella of the GRP, which will continue to actively link to various CEOP activities.

Recent Publications:

- Lawford, R., R. Stewart, J. Roads, H. Isemer, M. Manton, J. Marengo, T. Yasunari, S. Benedict, T. Koike, S. Williams, 2004: Advancing global and continental scale hydrometeorology: Contributions of the GEWEX Hydrometeorology Panel (GHP). *Bull. Amer. Soc.*, Dec. 1917-1930
- Roads, J., 2005: Report of the 11th Annual Meeting of the GHP. Melbourne, Australia. September 26 - 29, 2005. *GEWEX Newsletter*, 15(4), 1-2.
- Roads, J., 2006: GHP Water and Energy Budget Study. *GEWEX Newsletter*, Vol. 16, No. 2. 6-8
- Roads, J., H. Isemer, K. Takahashi, T. Yasunari, S. Williams, J. Huang, S. Loeheer, J. Marengo, L. Horte, M. Silva Dias, E. Berbery, J. Jeitin, B. Crawford, K. Szeeto, 2006: Data sets from the CSEs. *GEWEX Newsletter*, 16, No. 3, 3-9.
- Roads, Benedict, Koike, Lawford, Sorooshian, 2006: On the Transition of GHP to CEOP and Realignment of CEOP with GEWEX. CEOP Project Office, 10 pp.
- Rockel, B., Roads, J. Meinke, I., Gutowski, W. J., Arritt, R. W., Takle, E., 2005: The Inter-CSE Transferability Study, CEOP Newsletter No. 8, p. 4-5, August 2005.
- Takle, E. S., Roads, J., Rockel, B., Gutowski Jr., W. J., Arritt, R. W., Meinke, I., Jones, C. G. , and Zadra, A. 2006: Transferability intercomparison: An opportunity for new insight on the global water cycle and energy budget. *Bull. AMS In Press*

List of Meetings, Workshops:

2005/10	GHP Meeting	Melbourne, Australia
2006/01	GEWEX SSG	Dakar, Senegal
2006/03	CEOP	Paris, France

Planned Meetings, Workshops:

2006/10	Pan GEWEX	Francia, Italy
2007/01	GEWEX SSG	Honolulu, Hawaii

List of members and their term dates where appropriate (including changes):

Name	Function	Miscellaneous
J. Roads	GHP Chair	GHP/CEOP whitepaper
	CSE	
Hok Woo	MAGS	Final report due
Jin Huang	GCIP/GAPP/CPPA	Final reports due for GCIP/GAPP, Science and Implementation Plan for CPPA
Jose Marengo	LBA	
Hugo Berbery, Maria Silva Dias	LPB	Implementation plan due
Hans Isemer	BALTEX	
Amadou Thierno Gaye	AMMA	
Jun Matsumoto	MAHASRI	Implementation plan due
Alan Seed	MDB	Implementation plan due
Pasha Groisman	NEESPI	Proposal due
	Working Group	
Steve Williams	DM	GEWEX News
John Roads	WEBS	GEWEX News
David Noone	SWING	
Ron Stewart	WISE	
Eugene Takle	TWG	BAMS paper!
Colin Jones	GHP/GMPP	
Burkhardt Rockel	TWG-CEOP/WESP/ICTS	CEOP News!
Eric Wood	HAP	
	Global Project	
Thomas Maurer	GRDC	
Tobias Fuchs	GPCC	
Alan Hall	IAHS	
Toshio Koike	CEOP	
John Schaake	HEPEX	