

GEWEX Hydroclimate Panel (GHP)

Reporting Period: January 2010 – July 2011

URL: http://www.gewex.org/ghp_mtg_2012.html

Chair(s) and term dates:

Co-Chairs: Drs Dennis Lettenmaier and Jan Polcher

(Dr Lettenmaier has asked to step down and Dr Jason Evans is Co-Chair "Elect" to replace him. Drs Polcher and Evans will Co-Chair GHP for 2-year renewable terms upon approval by the GEWEX SSG at its 15-18 October 2012 meeting in Sydney, Australia.)

1. Panel activities

GHP has essentially made a full transition from the Coordinated Energy and Water Cycle Observations Project (CEOP), and there are a number of developments within and beyond GHP that have occurred that have influenced the form and content of its activities. GHP along with the other GEWEX Panels has undergone realignment in all of its activities. The Co-Chairs have developed an outline of plans for further study and implementation over the next 2-3 years period. Decisions have been made concerning the priority of each element in the context of the contribution GHP must make to the GEWEX Imperatives and Grand Challenges. This evaluation has allowed the Co-Chairs to make recommendations to the SSG about consolidating GHP work and redirecting priorities to be more in line with the next phase of GEWEX. As a result a new organization chart was developed (see figure below). GHP is focused on evaluating each Regional Hydroclimate Project (RHP) using new criteria approved by the SSG that will ensure GHP retains its leadership role in hydrologic science and modeling within WCRP/GEWEX. Each RHP and the supporting science elements in GHP will continue to build on progress it has already achieved in seasonal forecasting, the detection and attribution of change, and the development and analysis of climate projections. GHP is also focused on the SSG challenge to foster collaborations with other groups with common interests in land-surface processes, including CORDEX, GDAP, GLASS and CLIVAR to deal with a number of important issues that range from monsoons, to extremes and how to help coordinate the multitude of national initiatives in those areas.

2. Science highlights

Reference site data sets (from NCAR) have been placed into the "Protocol for the Analysis of Land Surface Models (PALS)" website (www.pals.unsw.edu.au), GFS MOLTS and gridded data sets have been converted to the netCDF format for archival. MOLTS (converted to netCDF) model output has also been sent to the PALS website in specific for the reference site of Bondville, USA. In addition, an updated spreadsheet of the MOLTS variables which have the latest NCEP attributes has been created, an updated spreadsheet of the reference site characteristics per the NCEP GFS model is also available now, and a sample Grads 2.0 control file that can be used to display the data of a netcdf file was also produced. Work has also advanced within each GHP RHP (see poster prepared for the Chapman Conference February 2012, Hawaii)

3. Science issues

GHP/GEWEX has not achieved agreement on how to proceed with a joint monsoon initiative with CLIVAR. The GHP Executive committee (Co-Chairs, International Coordinator, Director IGPO) have agreed to be open to such a joint initiative, however, this issue has morphed into a broader discussion of the GEWEX/CLIVAR interface. In this respect, GHP has agreed to look for other opportunities to contribute to monsoon science that are more in the course of the further development of its own strategic plans including the possibility of a North American Water Project (NAWP) Regional Hydroclimate Project (RHP) that may include an American monsoon regional

component that would provide the basis for GHP to meet its goal of having a monsoon study element as part of its contribution to the GEWEX Imperatives/Grand Challenges.

4. New projects in place

In terms of projects in Africa and South America we know that there are a number of new RHPs “in the making” that will be reported on at the 11-13 October 2012 GHP meeting at the UNSW, Sydney Australia. One of the proposed projects is in Africa, but none are associated with South America, although there are two projects under consideration for North America and all are expected to have elements that will contribute to the GEWEX Grand Challenges (GCs) to which GHP is committed to make meaningful contributions. The list includes the following.

- (i) The Saskatchewan River Basin Project (SRB), which should have advanced to the level of formal acceptance as a GHP Regional Hydroclimate Project (RHP) in accordance with new criteria for acceptance of RHP status by GEWEX.
- (ii) The Hydrology of the Lake Victoria Basin (HYVIC) study, which is developing under the auspices of GHP, but which needs formal recognition as a potential RHP “in the making” in order to garner more international visibility and support.
- (iii) The North American Water Project (NAWP), which is evolving through initial steps toward meeting the new criteria for eventual RHP status.
- (iv) The Third Pole Environment (TPE) initiative that has been discussed in international meetings and that is expected to take initial steps toward RHP status by the end of 2012.

5. Workshops/meetings held

- GHP meeting held at Boulder Colorado, October 2011
- Ad Hoc meeting on data set development with GLASS participants held at AGU meeting December 2011, San Francisco, CA, USA
- Three strategic planning telecons held between October 2011 and October 2012

6. Contributions to developing GEWEX science; fit to GEWEX imperatives

In terms of a GHP contribution to an implementation strategy, GHP is poised to initiate crosscutting projects that will actively involve, but not be limited to, participation of RHPs. These projects are to be focused on specific science issues that will be contributions to GEWEX imperatives and grand science questions. They will be one or two year initiatives, so that “big” topics, such as droughts, would be addressed in a series of such projects that are focused enough to be done in a relatively short time period.

A brief “project” proposal has been developed for further discussion and review. The form of the proposal follows a generalized template, developed by GHP, for submittal of such ideas.

Two “projects” in this format will be proposed for kick-off in October 2012 to be accomplished by the end of 2014.

One is drought related and will include international coordination with the Chinese as a follow-on study from GDIS, which left much to be addressed in this arena. GHP with its regional focal points and its examination of land-area issues is perfectly positioned to move forward to address some of these.

A second project of this type to kick-off in October 2013 is short time-scale precipitation extremes. This project aims to better characterize the global distribution and temporal trends in precipitation extremes at daily and shorter time-scales. It will also examine future changes in these extremes as projected by climate models (CMIP5 and CORDEX). This will provide more robust knowledge of the global state of precipitation extremes, the relationship between daily and shorter time-scale extremes, and the potential changes due to global warming.

GHP's commitment to the regional activities of GC1 and GC5 is essential. We feel that the proposed crosscut on extremes is, therefore, a good approach. It is understood that there is still a need to discuss if short time scales is the only or optimal choice. Some doubt was expressed in GHP regarding the availability of data, for such an initiative. The way around this was felt to be to take the longer scales (droughts) as implied in the complementary second proposal, which is more in line with GC5 (water availability) and more realistic for GC1 (intra-seasonal to seasonal prediction).

7. Workshops / meetings planned

(a) HYVIC Planning Workshop

Meeting date: December, 17(Mon)-20(Th); 2012

Venue: Kampala, Uganda, Speak Hotel, Munyonyo (shore of Lake Victoria)

Desired sponsorship: WCRP/GEWEX and relevant national/international institutions.

(This could be more than a few and may particularly include some young/early career scientists besides a few mainstream GEWEX/GHPers)

(b) Joint GHP/CORDEX Session at Pan-CORDEX meeting November 2013 at Brussels. This will be attended by a small number of individuals.

8. List contributions to the GEWEX Grand Science Questions and plans how these will be included.

The GHP Co-Chairs reviewed the JSC report and concluded that the actions for GHP are largely related to the "Prediction and Attribution of Extreme Events" Grand Challenge (7.6). Specifically we were asked for feedback on reducing the number of initiatives. I would say that I3 and I4 (seasonal and longer predictions) are already covered in the Regional GC (7.1), which means they could be removed from this GC (7.6).

The request for action from the SSG Chairman suggests that it was perhaps advantageous to combine workshops on the "Changes in Water Availability" GC and the "Prediction and Attribution of Extreme Events" GC. The initial thought on this in GHP is that this is not a good idea. The rationale for that thought seemed to hinge on the fact that the scope of the Water Availability GC is so large as to practically be a Pan-GEWEX meeting itself. Adding in the Extremes work as well, it was thought, would be too much for a single workshop.

9. Other key science questions that you anticipate your community would want to tackle in the next 5-10 years within the context of a land-atmosphere project

Some issues that need to be addressed from the global/regional perspective of GHP in regard to a "project" associated with Drought (see item 6. Above) include:

what is the observationally based global (regional) distribution of drought?

what kind of drought is it (hot, cold, devoid of precipitation, some precipitation, etc.)?

what is its extent and severity?

what are the pathways of evolution including its cessation?
how does it interact with precipitation regions including internal variations?
how have human influences affected drought?
how better predict drought and its features?

10. Briefly list any specific areas of your panel's activities that you think would contribute to the WCRP Grand Challenges as identified by the JSC.

- Provision of skillful future climate information on regional scales (includes decadal and polar predictability)
- Regional Sea-Level Rise
- Cryosphere response to climate change (including ice sheets, water resources, permafrost and carbon)
- Improved understanding of the interactions of clouds, aerosols, precipitation, and radiation and their contributions to climate sensitivity
- Past and future changes in water availability (with connections to water security and hydrological cycle)
- Science underpinning the prediction and attribution of extreme events

GHP's commitment to the regional activities of GC1 and GC5 is essential. We feel that the proposed crosscut on extremes (see item 6 above) is, therefore, a good approach. It is understood that there is still a need to discuss if short time scales is the only or optimal choice for such studies. Some doubt was expressed in GHP regarding the availability of data, for such an initiative. The way around this was felt to be to take the longer scales (droughts) as implied in the complementary second proposal, which is more in line with GC5 (water availability) and more realistic for GC1 (intra-seasonal to seasonal prediction).

11. Cooperation with other WCRP projects (CLIVAR, CliC, SPARC), outside bodies (e.g. IGBP) and links to applications

GHP/GEWEX has discussed the possibility of a joint monsoon initiative with **CLIVAR** and this matter is still being iterated upon (See item 3 above.)

GHP expects to enlist the regional Hydrometeorological Experiments (RHPs) to make use of the **CORDEX** simulations either by validating them or using the output for impact studies. For the various RHPs, which will present they current status, we will ask them how they view their usage of the CORDEX data. Perhaps we can make a résumé of what we learn at the GHP meeting for the benefit of the CORDEX-SAT.

12. Issues for the SSG

13. List of key publications (*where appropriate*)

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

Dr Hugo Berbery,
Dr Mike Ek,
Dr Jeff Walker
Dr Richard Harding,
Dr Ana Nunes,
Dr. Vincenzo Levizzani,
Prof. Shinjiro Kanae
Prof. Xiaodong Zeng
(Co-Chairs)