

GEWEX Modelling and Prediction Panel (GMPP)

Reporting Period: 2008

Chair(s) and term dates: Christian Jakob; 2006-2008

Objectives:

GMPP's role is to coordinate the activities within GEWEX that aim at improving the representation of the global water and energy cycle within Earth system models. Furthermore, it coordinates collaboration with modelling and related observational activities within and beyond GEWEX. Particular focus areas of GMPP are cloud systems, land-surface processes and the atmospheric boundary layer (ABL). To address these difficult areas of parametrization adequately, GMPP is organized into three activities:

- The GEWEX Cloud System Study (GCSS)
- The Global Land/Atmosphere System Studies (GLASS)
- The GEWEX Atmospheric Boundary Layer Study (GABLS)

Progress Report:

The main activities of GMPP take place in the three study groups mentioned above and are summarized in the progress reports of those groups.

GMPP's main coordination-level activity this year was to establish enhanced collaboration with the newly formed parametrization expert group within the Working Group on Numerical Experimentation (WGNE). This effort was proposed last year and discussed at the SSG in January 2008. A November 2008 GEWEX Newsletter article describing the effort can be found on page 5 of <http://www.gewex.org/Nov2008.pdf>. Both the World Climate Research Programme (WCRP) and the Commission for Atmospheric Sciences (CAS) endorsed the formation of the expert group within WGNE as well as the admission of GMPP, GCSS, GLASS and GABLS chairs as members of WGNE. The first meeting of the newly structured WGNE group took place in November 2008 in Montreal, Canada. Christian Jakob was appointed the new co-chair of WGNE with particular responsibility for coordination of the parametrization effort. The meeting was exceedingly successful, with GEWEX efforts in parametrization development clearly at the core of the new expert group. It is a testament to the fantastic work done in each study group over the past decade that the community has fully embraced these efforts and that they form the foundation of the plans to enhance parameterization research within the World Meteorological Organization (WMO).

As a consequence of the new effort, the WGNE meeting addressed a large number of parametrization-related issues, all of which are intrinsically related to GMPP as well. The following is an excerpt from the forthcoming WGNE meeting report:

The meeting discussed at length the perception that some parametrizations, most notably that of deep convection, will soon be obsolete due to the emergence of convection-permitting global models. It is the firm opinion of WGNE that the use of such models in global operational NWP (Numerical Weather Prediction) is at least a decade away. Furthermore, its use in operational seasonal and climate prediction is not likely to occur for an additional decade after that. WGNE therefore strongly urges a reinvigoration and increase in activities related to parametrization research for global models.

The meeting received reports from all three GEWEX parametrization efforts, namely the GEWEX Cloud System Study (GCSS), the GEWEX Land-Atmosphere System Study (GLASS) and the GEWEX Atmospheric Boundary Layer Study (GABLS). WGNE congratulated the studies on their achievements in 2008 and encouraged all of them to continue along the plans they presented. In particular, WGNE encouraged GABLS to maintain its major efforts to improve the representation of the stable boundary layer in models and to withstand the temptation to move on to potentially easier problems.

A specific topic of the discussion was how to best progress work on the representation of microphysics. It is recognized that the importance of this representation is increasing in all areas of modelling, especially in convection-permitting models as well as models that include cloud-aerosol

interactions. It was decided to focus research efforts through the recently created GCSS working group on microphysics. WGNE encourages its members and the wider research community to make best use of this effort by participating in existing activities of the group and by suggesting new projects for it to take on. In particular WGNE suggests building on the existing efforts in GCSS and expanding to include the increasing number of operational convection-permitting models in the GEWEX model evaluation and development activities.

The new co-chair presented a number of proposals to enhance the parametrization effort and to engage a broader community in its activities. Three initiatives in particular were discussed and supported by WGNE. First the co-chair has been tasked to conduct an audit (i) on existing parametrization activities in the broader WMO community and (ii) on the problems ascribed to parametrization issues throughout the application communities including NWP and data assimilation, seasonal prediction and climate simulation and projection. Results of an initial survey are encouraging in its response. A second initiative, led by Dr Joao Teixeira (JPL), is to organize a conference/workshop on the representation of physical processes in Climate System Models. WGNE agreed to support such a meeting subject to a more detailed plan being submitted to members and discussed by email. It is likely that the conference, rather than focussing on model components, will discuss parametrization issues in various applications and geographic regions, including issues of coupling. WGNE also supported a proposal to write a white paper on parametrization issues. It was decided to tie the publication of the paper to the conference and to request the conference organizers to seek broad community input and support for the conclusions of the paper.

GMPP and in particular the three studies will play a central role in all the activities proposed by WGNE.

Plans for 2009:

The GMPP study groups will continue their efforts as outlined in their individual reports. Much of the work will focus on the collaboration effort with WGNE at the GMPP coordination level, as GMPP is at the core of that effort.

With my appointment to co-chair WGNE I will be unable to continue in my role as GMPP chair. I am therefore seeking to resign from that role at a time in 2009 that allows for sensible succession planning and implementation. I would like to take the opportunity to thank all my friends and colleagues in GEWEX and beyond. In particular I would like to thank the chairs of the study groups who made my life as GMPP chair very easy. I would also like to give special thanks to the GEWEX International Project Office for their support over the years. It has been great fun to working with all of you.

New Directions:

With the establishment of the WGNE parametrization expert group, which integrates the GMPP study groups into a larger WMO effort on parametrization, it is worthwhile to rethink the GMPP structure within GEWEX. From my own experience as GCSS and GMPP chair over the last 5 years I would suggest to maintain GMPP but have it co-chaired by the co-chairs of GCSS, GLASS and GABLS, instead of appointing a separate chair. As all the actual work is carried out in the three study groups, their chairs are best placed to coordinate efforts and to identify potential areas for collaboration both among GMPP groups and within the wider community. The recent successes in collaboration, such as the Cloud Feedback Model Intercomparison Project (CFMIP), the Aerosols, Clouds, Precipitation and Climate Initiative (ACPC) and the Global Land Atmospheric Coupling Experiment (GLACE) project, were all initiated from within the study groups. The study group chairs are also best placed to represent GEWEX in the wider community, as is evident from their recent appointment as WGNE members.

Recommendations and Issues for the Attention of the SSG:

- To note the successful implementation of a parametrization expert group under the auspices of WGNE, with automatic membership for the GMPP and study group chairs.
- To congratulate the GMPP study groups on their continued success in supporting the community's efforts in parametrization development and endorse their plans for 2009.

- To endorse the participation of the GMPP study groups in the proposed activities of the WGNE parametrization effort as outlined in this report.
- To accept the resignation of Christian Jakob as Chair of GMPP at a time in 2009 that is convenient for succession planning and implementation.
- To note and discuss the proposal for future GMPP leadership outlined in this report.

Summary:

In 2008 GMPP was at the heart of the implementation of a new parametrization initiative that resulted in a new expert group on parametrization within WMO under the auspices of WGNE. The role of this group is to advise all WMO activities in the area of parametrization and to set the agenda for parametrization development activities. The existing GMPP study groups form the core of this new activity. Through the GMPP groups, GEWEX continues to drive progress in this very important area of research.

List of Meetings, Workshops:

November 2008, WGNE-24, Montreal, Canada

Planned Meetings, Workshops:

November 2009, WGNE-25, Frankfurt, Germany