GEWEX Data and Assessments Panel (GDAP)

Reporting Period: September 2011 – 2012

URL: *http://gewex.org/GDAP.html; http://rain.atmos.colostate.edu/GDAP/index.html*

Chair(s) and term dates: Christian Kummerow (2008 – present); Vice Chair Joerg Schulz (2010 – 2013)

1. **Panel activities**

   Activities of the GDAP can be divided simply into Data Products, Product Assessments, and Radiative Transfer Code Assessments. The individual products for Clouds (ISCCP), Aerosols (GACP), Radiation (SRB), Turbulent Fluxes (SeaFlux and LandFlux), as well as precipitation (GPCP) continue with reasonable support except for GACP, which is currently unfunded. Each of the GEWEX reference products is currently preparing for a reprocessing cycle that will result in common space and time grids as well as ancillary data and assumptions. These will be merged into a single product called the GEWEX Integrated Water and Energy Product.

   With independent products available for the water and radiative terms of the Earth system, GDAP is now focused on creating an integrated reference product in which the individual products use a common space and time grid as well as common ancillary data and procedures in order to ensure that geophysical signals and their co-variances are tied to the data and products themselves rather than inconsistencies in their assumptions. Reviewing the readiness of GEWEX reference products for this reprocessing with common assumptions and setting realistic goals for product deliveries was the primary objective of the GDAP team meeting held in Paris on 1-3 October 2012.

   The first year of the integrated product is now scheduled for delivery by 30 June 2013. Clouds and Aerosols will be delivered first (by January 2001). Radiation and Precipitation products will follow by March 31 as they serve as input to the turbulent fluxes. LandFlux and SeaFlux will deliver the first year of products by May 31 so that a full can be composited by 30 June 2012. Once completed, GDAP will undertake an assessment of the state of the Water and Energy Budgets based upon this new Integrated product. This assessment, which is intended to document the state of our observing system, is meant to be the first in a periodic reevaluation of the state of the Water and Energy Observing System. The assessment will consist of closure tests on the global scale; temporal variability in the fluxes and states; attribution of changes to observed forcings; and a maturity index of various components based upon ongoing assessments of individual components of the budget. Panel members and Peter Bauer from the SSG were identified for this evaluation that is intended to assess not only products but their stated uncertainties as well.

   With respect to Assessments, the panel has now finished the Precipitation, Clouds and Radiation products. Journal versions of the last two assessments were submitted in order to make them available to the IPCC assessments. GDAP is currently actively involved in the Aerosol assessment as well as the newly initiated Water Vapour Assessment. LandFlux and SeaFlux have proceeded along the lines of combining initial assessment with product recommendations so those two are still on-going but with a different character as they are recommending the GEWEX standard product rather than assessing an existing one.

   A new assessment is underway for the Satellite simulators that are being actively developed to simulate a number of active and passive sensors. The assessment of these simulators is seen as beneficial to highlight the internal assumptions made by the simulators.

2. **Science highlights**
   - All GEWEX reference products agreed to deliver the first year of the Integrated Product parameters (including uncertainties) by 30 June 2013.
   - ISCCP and GPCP are being transitioned to Operational Agencies for sustained processing
   - GDAP completed Assessments of Clouds and Radiation products. Reports are available from WCRP. Short versions have also been submitted as Journal articles.
   - GDAP will continue to update the "Assessments Lessons Learned" document on its web page for use by other groups.
   - SRB project has computed new Surface and TOA fluxes. Discrepancies at the surface now amount to ~15W/m^2 relative to precipitation in terms of the overall budgets.

3. **Science issues**
   The Panel views in situ reference measurements of radiation (BSRN), precipitation (GPCC), water vapour (through well calibrated radiosondes) and latent heat flux from ships and towers around the world as an important reference for Climate Data Records. The SSG and WCRP might consider a concerted effort to foster small but highly characterized networks (similar to BSRN) that can be used to assess satellite stability over very long periods. The maintenance of these activities is central to satellite derived products and GDAP cannot emphasize their importance enough.

4. **New projects in place**
   GDAP has not formally initiated any new projects

5. **Workshops/meetings held**
   - 26-28 September 2012 – GEWEX Water Vapor Assessment meeting. Offenbach, Germany
   - 01-03 October 2012 –GEWEX Data and Assessments Panel meeting, Paris, France
   - 04-05 October 2012 – LandFlux Assessment meeting, Paris, France

6. **Contributions to developing GEWEX science; fit to GEWEX imperatives**
   GDAP provides global products designed to test model processes related to the water and energy budgets.

7. **New projects and activities being planned, including timeline**
   GDAP is evaluating the feasibility of formalizing the Satellite Simulator Assessment as well as initiating a Working Group on Water Storage. Decisions should be made at the next GDAP meeting in the Fall of 2013.

8. **Workshops / meetings planned**
   - 22-26 April 2013 – ISCCP at 30 Workshop, NY, NY
   - April 2013 – Joint SeaFlux/LandFlux WG meeting (currently considering EGU)
   - August 2013 -– Water Vapor Assessment meeting
   - October 2013 – GDAP meeting (Rio? Exact dates TBD)
   - December 2013 – GEWEX Integrated Product Session (currently considering AGU)

9. **List contributions to the GEWEX Grand Science Questions and plans to include these.**

   - **Observations and Predictions of Precipitation**
     GDAP works closely with NASA and JAXA to promote the Global Precipitation Mission and to ensure that its products meet GEWEX objectives for both process studies and climate trends. The same is true for work with the German Weather Service (DWD) to ensure that gauge data meets the same needs.

- **Global Water Resource Systems**
  The panel does little related to Water Resource Systems

- **Changes in Extremes**
  Satellite observations of precipitation are being used to examine changes in precipitation distributions, including extremes in many parts of the world. GDAP is also engaged with the gauge analysis community. While it is not possible to release individual station data, the panel is actively searching for ways to work with DWD to provide statistics suitable to studying extremes.

- **Water and energy cycles**
  Observations of the water and energy cycles is the central theme of GDAP. The panel strives to close those budgets on global as well as a regional scales as a measure of fundamental uncertainties in today's observations. The panel strives also to make the products consistent and accessible to promote process understanding.

10. 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

The panel would like to add terrestrial water storage (both in terms of soil moisture, snow depth and reservoir storage) and fluxes (runoff) to its set of global products in order to expand the closure requirements of the water and energy budgets over land. This leads to the same goals of establishing uncertainties and providing process information as the current data sets.

The panel would like to gain confidence in the Arctic products currently being produced with the goal of ascribing ice melt to specific feedbacks in the local water and energy budgets as distinct from circulation changes induced by global change.

The panel will also continue to focus on questions related to the onset of precipitation and the impact of aerosols on this question. We have begun this activity but progress is slow while global datasets are still being developed.

11. 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 (not covered under 9).

- **Provision of skillful future climate information on regional scales (includes decadal and polar predictability)**
  While the panel is not in a position to predict future climate, the panel can focus on process studies at regional scales that would be essential to verify that the regional climate models are indeed capturing the key elements of each region's unique physics.

- **Regional Sea-Level Rise**
- **Cryosphere response to climate change (including ice sheets, water resources, permafrost and carbon)**
  See point 2 in question **10**. The panel would like to gain confidence in the Arctic products currently being produced with the goal of ascribing ice melt to specific feedbacks in the local water and energy budgets as distinct from circulation changes induced by global change.

- **Improved understanding of the interactions of clouds, aerosols, precipitation, and radiation and their contributions to climate sensitivity**
  See point 3 in question **10**. The panel will also continue to focus on questions related to the onset of precipitation and the impact of aerosols on this question. We have begun this activity but progress is slow while global datasets are still being developed.

- **Past and future changes in water availability (with connections to water security and hydrological cycle)**

While GDAP can certainty help with past precipitation amounts and the distribution of rain rates that might be viewed as important for water availability, the panel has no particular information on water availability or changes therein

- **Science underpinning the prediction and attribution of extreme events**
  GDAP global products are designed at 1 degree and 3 hourly time steps so that extremes and processes related to extremes may be seen in the data.

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

The SeaFlux product is being developed with input from the CLIVAR community and joint Workshops are being held. The SPARC community will be consulted soon about their evaluation of upper tropospheric humidity products to be integrated with the GDAP water vapor Assessment. Coordination with CLiC on high altitude water and energy budgets is clearly desirable.

13. Issues for the SSG

The Working Group for Data Management (WGDMA) was initially responsible for identifying the various ancillary data products to be used by the community. As this activity is now finished, GDAP recommends that this Working Group be discontinued.

GDAP would like to replace two retiring members (Enio Pereira and Mark Ringer) with new members to represent Soil Moisture and Water Storage. No names are being put forth yet and the time between the GDAP panel meeting and the SSG is too short this year. We would like to thank Enio Pereira and Mark Ringer for their contributions as their terms have expired.

The Continuous Intercomparison of Radiative Codes (CIRC) now is sponsored by GDAP and GASS. This seems to work out quite well.

14. List of key publications

Both the Cloud and Radiation Assessments have been submitted as WCRP reports and BAMS articles where both are currently under review. The GDAP products publish their papers independently.

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

Christian Kummerow	2008 – present
Joerg Schulz	2010 – present
Carlos Jimenez	2010 – present
Norman G. Loeb	2005 – present
Hirohiko Masunaga	2010 – present
Matthew McCabe	2008 – present
Enio Pereira	2010 – 2012
Mark Ringer	2010 – 2012
Axel Schweiger	2008 – present
Sonia Seneviratne	2008 – present
B.J. Sohn	2007 – present
Claudia Stubenrauch	2007 – present
Susan Van den Heever	2008 – preset
Tianjun Zhou	2011 – present
Andrew Heidinger	2012 - present