

## GEWEX Data Assessments Panel (GDAP)

**Reporting Year:** 2017

**URL:** <http://www.gewex.org/panels/gewex-data-and-assessments-panel/>

**Chairs:** Remy Roca and Tristan L'Ecuyer

### Primary Accomplishments

1. The first year of the new GEWEX Integrated Dataset has been generated and released to support energy and water cycle studies and model evaluation on both regional and global scales.
2. The water vapor assessment has been completed and corresponding report published.
3. New versions of several GEWEX-sponsored datasets have been delivered.

### Panel Activities

- Sponsored production and analysis of several key energy and water cycle datasets from ground stations and satellites. Examples include:
  - EBAF 4.0 released
  - ISCCP
  - SeaFlux 2.0 CDR being produced by NOAA with improved diurnal temperature, better calibration, and random and systematic errors.
  - GPCC v8.0 released
  - GPCP v2.3 transitioned to NOAA as part of Climate Data Records program. Prototype GPCP 3.0 under evaluation. Will include rain/snow discrimination and error bars that
  - SRB 4.0 has been developed and is under evaluation since several changes were implemented.
- Continued oversight of BSRN with several new benchmarking studies underway directed toward defining a SI traceable reference for longwave irradiance and documenting instrument performance in polar regions.
- An initial precipitation assessment documenting differences in climatologies and seasonal cycles of zonal means separated into land and oceanic regions
- An update to the cloud assessment is underway that will incorporate recent updates to many cloud datasets and six new datasets from spaceborne active sensors that did not participate in the original assessment. The cloud assessment will close once this update is complete.
- The LandFlux project continues to refine land-surface ET flux estimates though momentum has been lost and this activity needs to be redefined as part of a broader integrated land energy and water cycle assessment.
- Initiated new paradigm for integrated flux assessments and redefining core GDAP activities to better support other GEWEX panels and activities.

## **New Projects**

Joint GEWEX-CLIVAR activity centering on understanding Earth's energy imbalance (EEI) (expansion of the original CLIVAR CONCEPT-HEAT activity).

## **New projects and activities being planned, including timeline**

1. A broader regime-specific precipitation assessment is being developed in coordination with IPWG and PMM communities to address the needs of WCRP user groups. An initial scoping workshop was held in October following the PMM meeting. A follow-on is planned during IPWG 2018 meeting in Seoul in November..
2. While assessment of individual parameters will continue, some focus is shifting toward integrated assessments of global data projects that apply energy and water cycle closure constraints as an integrated measure of systematic errors in datasets.
3. A new radiative flux assessment focusing on vertically-resolved fluxes and heating rates from conventional approaches and new active sensors has been proposed.
4. GDAP will continue to actively engage ARM in future assessments and may consider basing a land surface closure assessment around the SGP site.
5. Formal soil moisture assessment
6. Formal assessment of land surface temperature under consideration
7. Following the new paradigm of integrated assessments using closure constraints, soil moisture, land surface temperature, ground heat flux, and land ET fluxes may be considered as part of an integrated land ET assessment. Such an activity would explore the degree of consistency between LandFlux, soil moisture, LST, and SRB to identify structural errors in the component fluxes.
8. A pathway toward a next-generation ISCCP product that incorporated improved sensor capabilities in support of WMO/CGMS cloud working group
9. GDAP could also advocate for data quality standards to be implemented by the International Soil Moisture Network (ISMN) ground-reference data

## **Science Highlights**

Consensus GDAP assessment activities are evolving along more integrated themes that seek tests of water cycle and energy balance closure and aim to establish consistency between datasets.

## **Science issues**

1. LandFlux activity has lost momentum and will not likely progress in isolation. It needs to be redefined as part of an integrated view of the land heat budget.
2. The aerosol assessment has concluded but the draft report has been in limbo for 2+ years and needs to be completed.

### **Contributions to developing GEWEX science; fit into GEWEX imperatives**

New paradigm of water cycle and energy balance closure and aim to establish consistency between datasets

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

- **Observations and Predictions of Precipitation**

Support and evaluation of ground-based and satellite-based global precipitation products

- **Global Water Resource Systems**

N/A

- **Changes in Extremes**

N/A

- **Water and energy cycles**

Support and evaluation of several radiative and evaporative flux datasets. Tests of water cycle and energy balance closure.

#### **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 (1-3 suggestions)**

1. Integrated assessment of land energy and water cycle closure in observations and reanalyses
2. Tracking energy and water flows on regional scales

### **Contributions to WCRP Grand Challenges as identified by the JSC**

*Regional Sea-Level Rise:* EEI initiative seeks to connect Earth's TOA energy imbalance to changes in ocean heat content, terrestrial water content, and sea level rise

*Improved understanding of the interactions of clouds, aerosols, precipitation, and radiation and their contributions to climate sensitivity:* Oversee the BSRN, ISCCP, CERES EBAF, SRB

*Past and future changes in water availability (with connections to water security and hydrological cycle):* Oversee/support production of global precipitation and evaporative flux datasets: GPCC, GPCP, LandFlux, and SeaFlux

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

GDAP will also directly contribute to complementary CONCEPT-HEAT studies directed toward quantifying global and regional EEI and establishing consistency between top of atmosphere fluxes and ocean heat

Difficulty to connect to the TIRA (task team of reanalysis) due to various logistical reasons

### **Workshops/Meetings Held**

- GDAP annual meeting
- GDAP-CLIVAR 1 day workshop on Earth's Energy Imbalance
- BSRN

### **Workshops / Meetings Planned**

- GDAP Annual Meeting (Lisbon, Portugal, November 2018)
- Precipitation assessment meeting (Seoul, November, 2018)
- Workshop on Earth's Energy Imbalance (Toulouse, France, Winter 2018)
- ISCCP Next-Gen Scoping Workshop (TBD)
- GEWEX Integrated Dataset User Workshop (Spain, March 2019)

### **Other Meetings Attended on behalf of GEWEX or your Panel**

- 2<sup>nd</sup> GEWEX Aerosol and Precipitation (GAP) workshop in Oxford, UK
- Upper Tropospheric Clouds and Convection (UTCC) PROES
- WDAC-6

### **Issues for the SSG**

Appointment of new BSRN chief

### **Key Publications**

GEWEX Water Vapor Assessment

### **GDAP Members**

Remy Roca (chair)

Tristan L'Ecuyer (vice-chair)

Isabel Trigo (new)

Seiji Kato (new)

Wouter Dorigo  
Andrew Heidinger  
Paul Stackhouse  
Christian Kummerow  
Hirohiko Masunaga  
Tianjun Zhou  
Claudia Stubenrauch