

Rapporteurs report for the GEWEX SSG Meeting 34B

Panel: GEWEX Data and Analysis Panel (GDAP)

Rapporteur(s): Maria Piles, Graeme Stephens

Adherence to GEWEX and Panel's objective(s)

GDAP has evolved his vision to center on global energy and water datasets (i.e. satellite) to support science questions; the focus is to provide expertise in global flux datasets and inform the community of their strengths and limitations, uncertainties, and best practices for using them (tied to science applications)

GDAP appropriately continues to evolve its objectives that in turn are centrally important to GEWEX's new goals. It has three main activities, surface network stewardship, assessment and projects.

Achievement of annual goals for this reporting period

The pandemic has slowed progress on their different initiatives but they are gaining momentum and after their meeting in Bern (26-30 Sep. 2022) they'll be well positioned to take on new projects.

- Surface networks: BSRN surface network confirmed as a GCOS recognized reference network, liaising with remote sensing community to serve as a longway reference standard. No link or updates from ISMN and GPCC networks.
- Projects:
 - Integrated Product project finalized.
 - Project to support cloud science with an advanced dataset: Cloud+. Effort to generate calibrated, gridded Level 1 radiances from common channels on modern geostationary satellites. Level 2 cloud, aerosol, radiative flux and precipitation products to follow. How to make data available has been noted as an issue.
- Assessments:
 - Joint IPWG/GEWEX precipitation report completed. This precipitation assessment has been long needed and is excellent
 - Water vapor Phase 2: making good progress, journal special issue published.
 - An assessment on how well do we understand EEI and its variability is on going - a workshop is planned next spring that may lead to a first set of publications of the key results

Major accomplishments and results in reporting period

- The Baseline Surface Radiation Network (BSRN) is being used as a reference for Copernicus Cal/Val needs. Strong connection with GDAP.
- Great coordination with IPWG for consolidation of the precipitation report.
- First prototypes of Cloud+ produced. GDAP expects and Cloud+ dataset to be a centerpiece of their activities in the coming years
- The new EEI assessment activity is thriving - a workshop is planned next spring that may lead to a first set of publications of the key results

Arisen or noted science issues

Panel activities at present are mainly focused on radiation and ocean-atmosphere studies, and land is not being covered. The appointment of panel member(s) with land expertise is encouraged to promote that GDAP covers observational data over land as well.

Emerging Science

There are a number of science areas that are ready to emerge especially to be linked to ISCCP-NG. One in particular is that of convection tracking, convection typing, and lifetime characterization as called out above). GDAP would be the ideal body to advance this topic by first assessing the various activities and data records that have blossomed over the past few years in preparation for application of these tools to the emerging ISCCP-NG 1b.

The panel speed dating was inspirational, with one new activity starting to take shape with each panel:

- GHP: supply subsets of global precipitation datasets for each of their Regional Hydroclimate Projects; investigate extreme precipitation and how to make satellite datasets more suitable for studying extremes (they're currently not really designed for this purpose)
- GLASS: Organization of a joint GDAP-GLASS workshop in early 2023. Potential exploitation of Level 1 radiances from modern geostationary satellites (Cloud+) with high revisit and 5-km to investigate different aspects of modeling land-atmosphere interactions at high spatial scales.
- GASS: apply km-scale global model simulations to emulate satellite observations and facilitate model evaluation/improvement

Future plans

H. Masunaga appointed as new co-chair in lieu of R. Roca. Three new member panels have been appointed, connecting to space agencies. Upcoming panel meeting in Bern (26-30 Sep. 2022) will be central to shaping future activities.

Recommendations to Panel

- The projects at present seem to be mostly data centric and we would suggest GDAP define projects, that could be long standing and more connected to science. This could include, for eg, regular updates on the energy balance and EEI as it is now doing analogous the regularly produced state of climate publication. Perhaps it could include some degree of ownership of new diagnostic tools that might, for eg, emerge from ongoing assessment studies such as the soon to be conducted convection based data product review/assessment and convection object property method assessment.
- In addition to its plans GDAP should 'sponsor' workshops on ISSCP-NG and co-sponsor a workshop on Convection object analysis – the latter could be co formed with for example the AOS management who seek to do something similar.
- Panels interactions: Yunyan Zhang is the liaison with GLASS. Perhaps it would be good to have a liaison with GLASS and GDAP as well.
- Harmonized in-situ data networks are fundamental for satellite validation and calibration needs. In this regard, it is recommended that GDAP coordinates with GHP and GLASS to make sure there is a GEWEX link with existing harmonized observational networks to gain insight about their current status and existing gaps in the context of present/future EO missions and observational capabilities (e.g. ISMN, GPCP).
- Communication with GCOS is lost. Try to reconnect?
- There is a great opportunity to connect the Cloud+ work to the evaluation and assessment of the emerging new generation of global km-scale models (cross w/Digital Earth Lighthouse activity).
- Communicate main results conveyed in detailed WCRP reports in scientific journals that point to the report. Visibility & Outreach.

Considerations for SSG

SSG meeting format: apart from the highlights from the Panels, perhaps also include in the agenda science presentations from one panel member or SSG member relevant to current GEWEX activities

Pan-GEWEX meeting has been very informative and beneficial to gain more understanding of the natures of the various activities within GHP and GLASS. It is suggested that SSG members try to participate in future GEWEX Panel meetings.

Additional Remarks

Regarding consistency of satellite data sets:

- Consistent data records of single variables are already being produced (e.g. ESA Climate Change Initiative). Beyond, optimization activities across several variables by enforcing global conservation laws and taking into account the uncertainty information that comes along with the data products -as done by GDAP on EEI- are very promising.
- Such approach could potentially be useful to other compartments, e.g. to ensure consistency in hydrological variables such as land surface water fluxes (including evaporation, transpiration and runoff) and storages (including soil moisture, vegetation and groundwater) for instance. Diagnostic tool for Digital Earth?