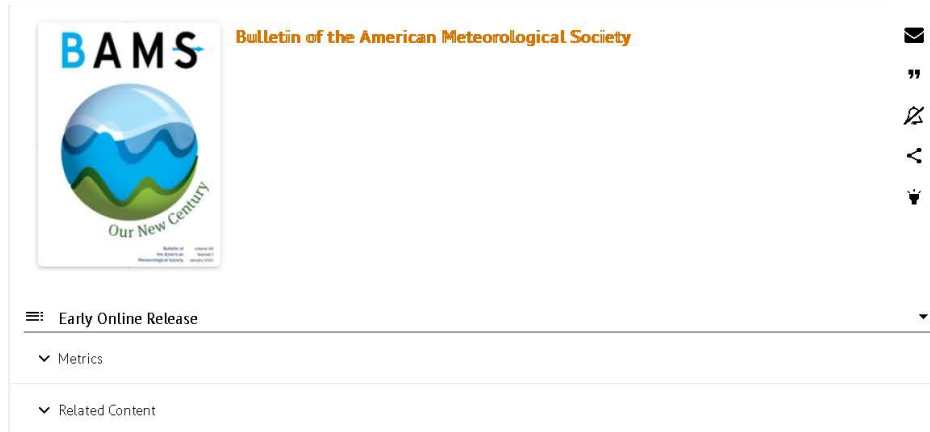


Recent GEWEX Activities

Xubin Zeng
GEWEX SSG Co-Chair

11 December 2022

For the GEWEX LS4P meeting



The screenshot shows the top portion of a web page for the Bulletin of the American Meteorological Society (BAMS). On the left is the BAMS logo, which features a stylized globe with blue waves and green landmasses, and the text "BAMS" in large blue letters above "Our New Century" in smaller black letters. To the right of the logo is the text "Bulletin of the American Meteorological Society" in orange. Below the logo and text is a navigation menu with three items: "Early Online Release" (with a hamburger icon), "Metrics" (with a downward arrow icon), and "Related Content" (with a downward arrow icon). To the right of the page, there is a vertical sidebar with icons for email, quote, share, and print.

[Previous Article](#) [Next Article](#)

Article Type: [Research Article](#)

The First 30 years of GEWEX

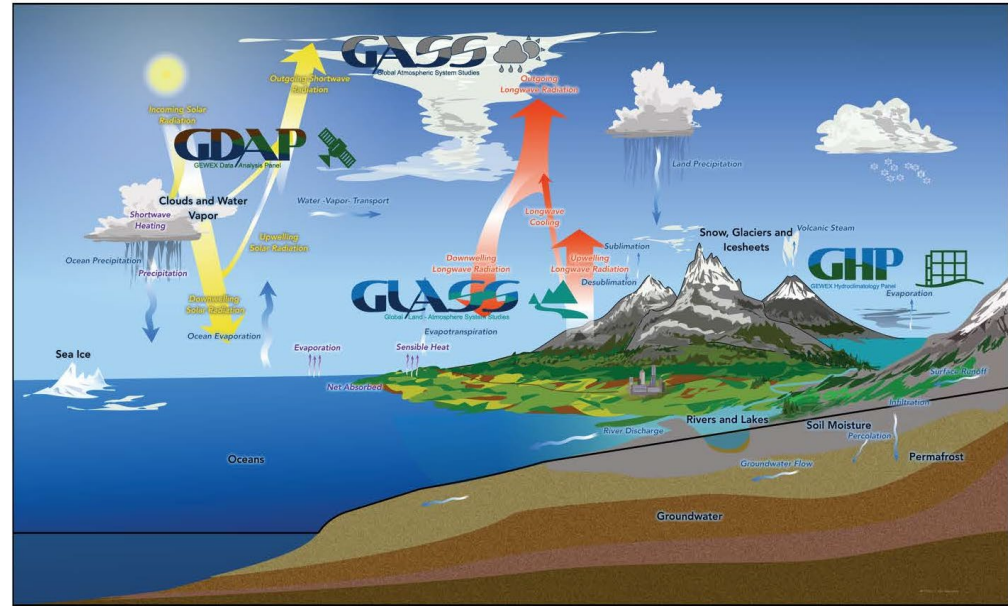
Graeme Stephens, Jan Potcher, Xubin Zeng, Peter van Oevelen, Germán Poveda, Michael Bosilovich, Myoung-Hwan Ahn, Gianpaolo Balsamo, Qingyun Duan, Gabriele Hegerl, Christian Jakob, Benjamin Lamptey, Ruby Leung, Maria Piles, Zhongbo Su, Paul Dimmeyer, Kirsten L. Findell, Anne Verhoef, Michael Ek, Tristan L'Ecuyer, Rémy Roca, Ali Nazemi, Francina Dominguez, Daniel Klocke, and Sandrine Bony

Online Publication: 02 Nov 2022

DOI: <https://doi.org/10.1175/BAMS-D-22-0061.1>

Recent GEWEX Panel Activities

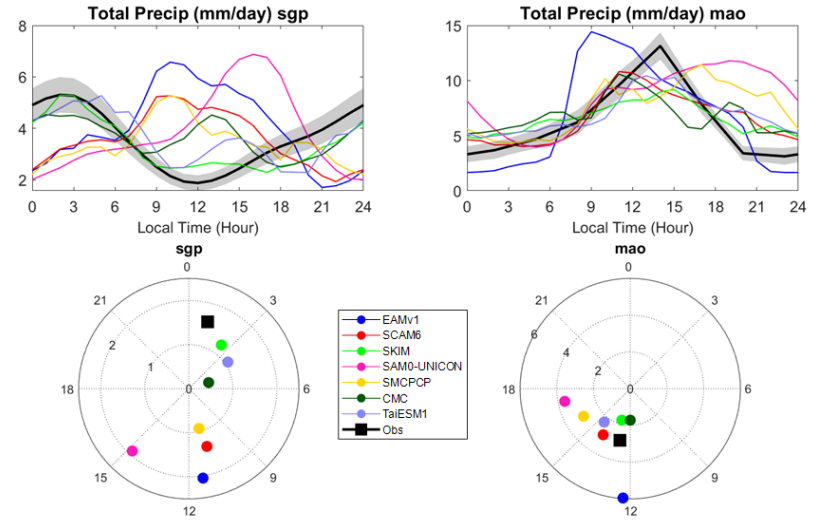
- **GLASS**: launched a project on the modeling of solar-induced chlorophyll fluorescence (SIF) in land models (SIFMIP) as a bridge to better understand the coupling of energy and water cycles to the carbon cycle, and launched another project on the coupling of atmospheric land and sub-grid parameterizations (CLASP).
- **GHP**: heavily engaged with scientists in different continents to explore and develop regional hydroclimatological projects, and has proposed a crosscutting project on flooding which has not received much attention in Earth system modeling.
- **GASS**: has been efficient in completing, continuing, and initiating projects, and is expected to launch new projects soon that are related to shallow and deep convections and their organization/aggregation and other topics.
- **GDAP**: in the process of developing a new strategy in helping the data and user community: instead of labeling “GEWEX datasets”, GDAP will try to develop the GEWEX criteria for satellite datasets (related to the energy and water cycles) to meet through data assessment and analysis.



The focus of the four GEWEX panels in relation to the global and regional water and energy cycles
(© P. van Oevelen, 2020)

Precipitation initiatives/X cut activities

- Understanding and predicting extremes
- Evaluating (global) models – a broad initiative funded by US DOE, led by Prof Christian Jakob
- Process understanding – warm rain PROES
- Updated climatologies (e.g. GPCP)
- **Diurnal cycle of convection (GASS)**
- Aerosol-precipitation process (GAP)
- Mountain Precipitation
- Precipitation assessment (GDAP)



Tang et al. (2021; GASS project)

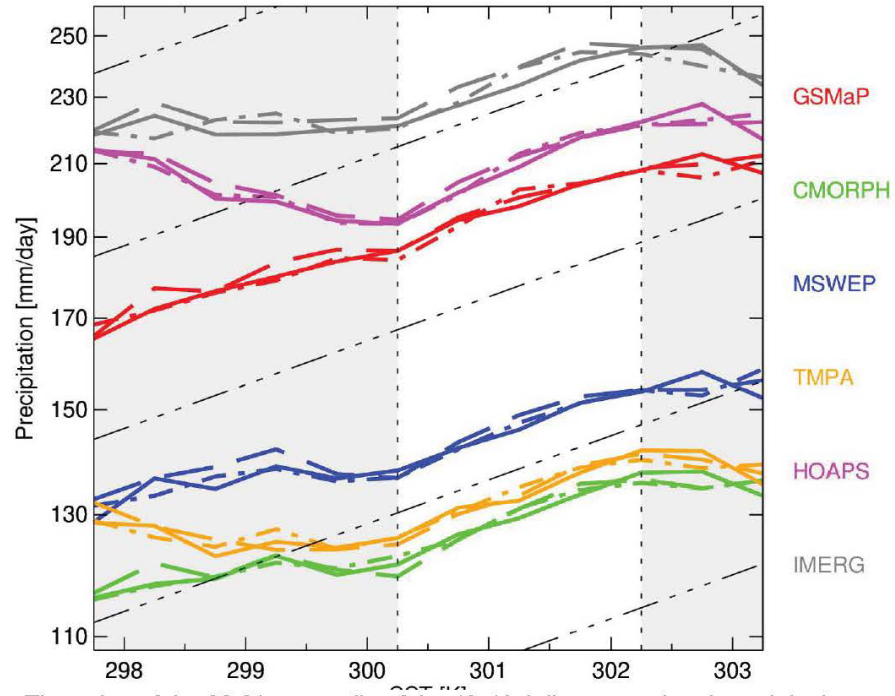
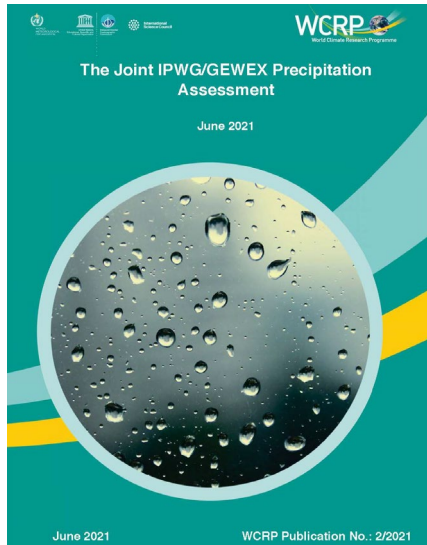


Figure 2.5.5. The value of the 99.9th percentile of the $1^{\circ} \times 1^{\circ}$ daily accumulated precipitation as a function of the SST lagged by 2 days. Each color corresponds to a precipitation product. Solid line for Operational SST and Sea Ice Analysis (OSTIA), dashed line for Optimally Interpolated Sea Surface Temperature (OISST) and dash-dotted lines for Optimally Interpolated Remote Sensing Systems Sea Surface Temperature (OIRSS). For the period 2007–2017. Regimes are separated by vertical dashed lines. The grey shaded areas indicate the non-robust cold regime between precipitation products (left) and the non-robust warm regime between SST products (right). Black dash-dotted lines correspond to the Clausius-Clapeyron 6%/K rate. From De Meyer and Roca, 2021

****INARCH-II,**

Hydrological processes in alpine cold regions

John Pomeroy, University of Saskatchewan



- Phase II Objectives: To better measure and atmospheric, hydrological, cryospheric, biol interaction processes; improve their predict diagnose their sensitivities to climate chang may be managed to promote water sustaina
- The INARCH-II network:
- 50 research scientists with wide-ranging ex world,
- 29 experimental research basins in 14 cour mountain regions on most continents.

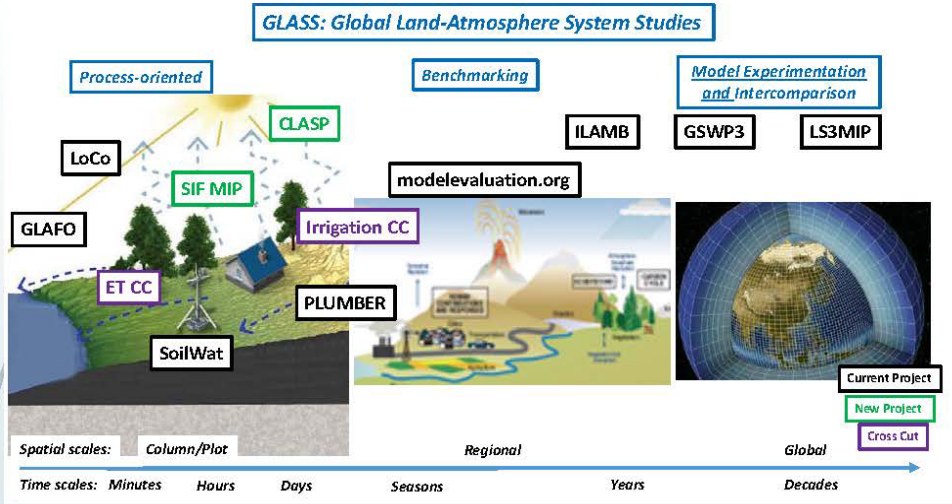
INARCH Research Basins

Austria: 1. Open Air Laboratory (OpAL);
Canada: Canadian Rockies Hydrological Observatory - 2. Marmot Creek Research Basin; 3. Peyto Glacier; 4. Quesnel River Research Basin; 5. Wolf Creek Research Basin;
Chile: 6. Upper Diguillin River Basin; 7. Upper Maipo River Basin;
China: 8. Nam Co Monitoring and Research Station for Multisphere Interactions; 9. Qomolangma Atmospheric and Environmental Observation and Research Station; 10. Southeast Tibet Observation and Research Station for the Alpine Environment; 11. Upper Heiluo River Basin;
France: 12. Arve Catchment; 13. Col de Porte Experimental Site; 14. Col du Lac Blanc Experimental Site;

Germany: 15. Zugspitze Basin and Schneefemerhaus Research Station;
Nepal: 16. Langtang Catchment;
Norway: 17. Finse Alpine Research Centre;
Russia: 18. Djankuat Research Basin;
Spain: 19. Izaña Research Basin; 20. Guadalefo Monitoring Network;
Sweden: 21. Tarfala Research Catchment;
Switzerland: 22. Duschma Research Catchment; 23. Weissfluhjoch Snow Study Site;
USA: 24. Dry Creek Experimental Watershed; 25. Grand Mesa Study Site; 26. Reynolds Creek Experimental Watershed; 27. Senator Beck Basin Study Area; 28. Sagehen Creek, Sierra Nevada.



Ten GLASS Panel Projects: From column (process) to global scale



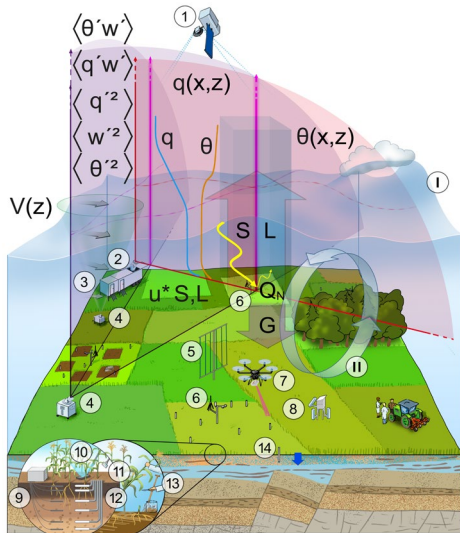
- **ILAMB:** International LAND Model Benchmarking
- **Modevaluation.org:** web application for evaluating and benchmarking computational models.
- **GSWP3:** Global Soil Wetness Project, phase 3
- **LS3MIP:** Land Surface, Snow and Soil Moisture MIP

Pan-GEWEX meeting, Monterey, 29 July 2022

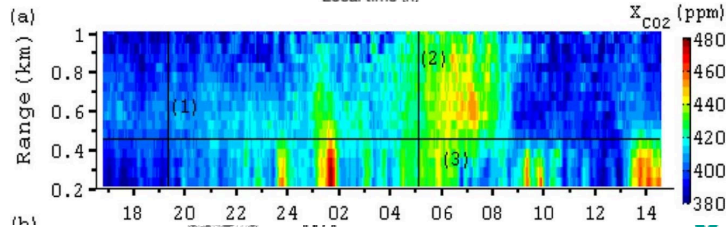
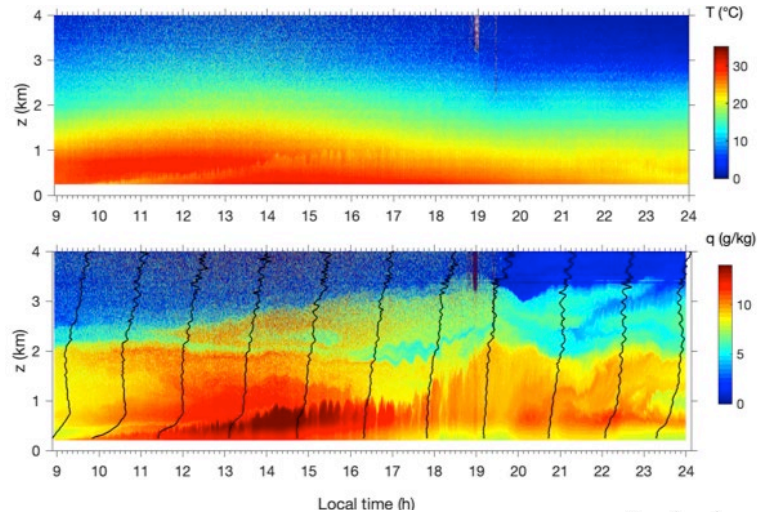
- **LoCo:** Local Coupling Working Group
- **GLAFO:** GEWEX/GLASS Land-Atmosphere Feedback Observatories
- **SIFMIP:** Solar-Induced Fluorescence MIP
- **CLASP** (Coupling of Atmospheric Land and Sub-grid Parameterizations)
- **SoilWat:** Soils and Subsurface processes
- **PLUMBER2:** The Protocol for the Analysis of Land Surface Models (**PALS**) Land Surface Model Benchmarking Evaluation Project, phase 2

GLASS GLAFOS (GEWEX Land Atmosphere Feedback Observatories)

Highly instrumented sites allow to monitor surface/atmosphere interactions for energy, water and carbon.
GLAFOS are currently being deployed



Lidar profiles for wind, temperature, moisture and CO₂. Observed in Palaiseau



WCRP Global Precipitation Experiment (GPEX)

- USGCRP initiated Global Precipitation EXperiment (GPEX) and met with WCRP in November 2021 to explore the possibility of taking this as a WCRP initiative.
- In May 2022, WCRP JSC approved a limited duration WCRP GPEX tiger team charged to work out a strategy for how WCRP will address major science gaps.
- In September 2022, the Tiger Team submitted a GPEX white paper to the WCRP JSC.
- In November 2022, WCRP JSC decided to set up a GPEX Science Team to work on a science plan that will explicitly address –
 - What is new in science (and possibly technology, service)? What has not been done by other WCRP projects? What can be done in five years?
 - What is the justification for GPEX to be a Pan-WCRP project (by bringing out the synergy of current WCRP core projects and LHAs)?
 - What GPEX activities are exciting and visionary?