

WCRP Global Precipitation EXperiment (GPEX)

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GPEX Tiger Team
27 June 2022

WCRP Charge

- The Tiger Team will be charged with working out a strategy for how WCRP will address major science gaps in the field of precipitation.
- This strategy should include options for the best (effective and efficient) enabling **structure within the WCRP** to advance this research, including how WCRP will **engage with other activities** happening internationally; e.g., in the U.S.
- The strategy will be presented at one of the next JSC meetings and the initiative will evolve from there.
- WCRP also intends to spin up **an African component of GPEX** with the goal to launch this at the time of the OSC 2023.
- WCRP would like to thank GEWEX who provided the attached concept note on GPEX with their suggestions got creating a GPEX tiger team, and their broad tasks.
- WCRP would like each core project and the monsoons WG to provide a name of one member who is willing to engage on this tiger team. WCRP would also like to ask Xubin to initiate the tiger team.

Background

- Agencies of USGCRP/USGEWEX and USCLIVAR have been interested in addressing key scientific gaps in precipitation prediction through the activity referred to as Global Precipitation Experiment (GPEX) since 2020.
- The concept of GPEX was discussed with WCRP GEWEX and CLIVAR in 2021.
- USGCRP met with WCRP on 3 November 2021 to explore the possibility of taking this as a WCRP (international) initiative.
- WCRP JSC decided to pursue this at JSC-42b meeting in November 2021.
- Further discussions with the WCRP leadership group led to the call on 29 March 2022 for membership of a limited duration WCRP GPEX tiger team. The membership was finalized on 9 May 2022.

GPEX Tiger Team

	WCRP GPEX tiger team:	
Name	Email	Core Project
Dr. Xubin Zeng	xubin@arizona.edu	GEWEX & Chair
Dr. Paquita Zuidema	pzuidema@miami.edu	CLIVAR
Dr. Annalisa Cherchi	a.cherchi@isac.cnr.it	Monsoons Panel
Dr. Sara Pryor	sp2279@cornell.edu	RfS co-chair
Dr. Lincoln Alves	lincoln.alves@inpe.br	RfS and works in Brazilian National Institute for Space Research (INPE)
Dr. Stefan Pieter Sobolowski	stso@norceresearch.no	RfS and NORCE Climate & the Bjerknes Centre for Climate Research
Dr. Takeshi Horinouchi	horinout@ees.hokudai.ac.jp	SPARC
Dr. Thamban Meloth	meloth@ncpor.res.in	ClIC
Dr. Jin Huang	jjin.huang@noaa.gov	NOAA/USGCRP

Iterative Process for White Paper Development

- 13 May 2022: First video conference; prepared individual 1-pagers
- 3 June 2022: Second video conference; kept or revise 1-pagers
- 19 June 2022: Chair (Zeng) prepared the first draft
- 27 June 2022: Briefed WCRP JSC.

- July 2022: Team member inputs on the draft
- July 2022: Zeng revision of the draft
- July 2022: Circulation of this draft for broad community input.

- August 2022: Further revision by Zeng
- August 2022: Additional input from Team members

- Sep 2022: White Paper approved by Tiger Team & submitted to WCRP JSC.

GPEX Structure

- WCRP GPEX Project or Lighthouse Activity (LHA)?
- GPEX Planning Group of 15 members with one chair or two co-chairs.
- Prepare GPEX Science and Implementation Plan in **one** year. Note: a similar task took 2 years for the S2S Project.
- Coordination by expanding an existing WCRP core project office or through a new International Project Office
- GPEX activities should be guided by the SSC with 15 members.
- 5-year period initially, with possible extension for a further 5 years, or subsequent work through regular core project activities.
- have regional/national committees

Vision, Mission, and Key Goals

Vision could be: Science and prediction of precipitation in a changing water cycle for sustainable development.

Mission could be: Coordinate national and international activities to improve precipitation science and prediction at different temporal and spatial scales, to make them publicly accessible, and to benefit the society.

Key goals could include :

- Better measurements of precipitation (liquid and solid), particularly over mountainous and high-latitude regions and in developing countries
- Better understanding of the complex precipitation processes and their interactions with the environment
- Improved prediction and projection of precipitation at different temporal and spatial scales
- Enhanced regional and local capacity building for precipitation measurements, understanding, prediction, and projection

Relation with WCRP and Non-WCRP Projects

Precipitation has been emphasized by, or is related to, numerous activities of WCRP core projects and LHAs and of other international projects. Therefore

GPEX needs to gather international initiatives already in place within WCRP programs, including observational campaigns already scheduled, modeling activities already planned, process studies already planned, and capacity development activities already scheduled, and how precipitation information is used by stakeholders.

GPEX needs to gather national and international initiatives already in place on precipitation science and applications from non-WCRP programs.

New Activities

Leveraging and coordinating with existing activities, GPEX should carry out a variety of activities with user engagement throughout the entire process.

- support the establishment and/or expansion of global and regional precipitation databases from satellite, radar, and gauge measurements.
- support the establishment of multi-model databases consisting of ensembles of weather and subseasonal-to-seasonal (S2S) precipitation forecasts for a common historical period and for the future, along with common evaluation metrics for deterministic, probabilistic, and extremes forecasts of precipitation.
- support existing and/or the establishment of new national and/or regional activities, partly through capacity building.
- support the capacity development, such as a series of workshops on precipitation science and prediction

International Precipitation Year (IPY)

International Precipitation Year (IPY) or International Year of Precipitation (YoP)?

- coordinated field experiments over different regions.
- increasing the number of sites for precipitation measurements in developing countries, high elevations, and high latitudes.
- coordinated high-resolution reanalysis/analysis and hierarchical modeling.
- coordinated evaluations of precipitation products and precipitation forecasts
- making all precipitation and associated data available
- Applications using these products and measurements

IPY could focus on extreme events at different seasons, such as:

- for winter, atmospheric rivers and the precipitation after landfall, and winter storms,
- for spring and summer, organized convection (e.g., mesoscale convective systems),
- for fall, hurricanes and the precipitation after landfall.