

CLIVAR/GEWEX Monsoons Panel Annual Report 2024

Co-Chairs:

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1. Panel overview

1.1 Background

The CLIVAR/GEWEX Monsoons Panel (MP) was established in 2014 with the remit of: (a) taking a more global view of monsoon activities, enabling knowledge and best practice to be shared between the various monsoon regions and (b) to better coordinate monsoons research between GEWEX and CLIVAR, particularly in emphasizing the role of convection and the land surface in the monsoons. The MP membership encompasses the research interests of both CLIVAR and GEWEX as well as all the regional monsoons, with in-country membership where possible. While the MP takes a global view, it is also important to address region-specific details, particularly in engaging regional stakeholders and managing local knowledge exchange and upskilling. Keeping this in view, the MP has established a sub-structure of working groups (WGs) dedicated to three monsoon regions, namely the Asian-Australian (WG-AAM), African (WG-AFM) and American (WG-AMM) Monsoons.

The three regional monsoons WGs are working towards enhancing understanding of the monsoons in those regions through various process studies with an emphasis on improving prediction skills in those respective areas. The primary focus of these groups is to build a partnership between operational met departments and researchers that is intended work on various strengths and limitations of the present climate models in predicting weather and climate in those regions. The regional working groups also establish sub-groups to focus on different topics. In these sub-groups, researchers beyond working groups, particularly Early Career Scientists (ECS), are engaged in various studies to address the significant issues of the regional WGs. The MP guides the WGs on multiple tasks and research priorities and in promoting cross-cutting activities and synergies among groups.

See Monsoons Panel web pages for Terms of Reference (ToRs), membership and previous reports:

- <http://www.clivar.org/clivar-panels/monsoons>
- <https://impo.tropmet.res.in/wcrp-monsoon.html>

Activities of the MP are supported by the International Monsoons Project Office (IMPO), hosted at Indian Institute of Tropical Meteorology (IITM), Pune, India, under a new agreement signed between WMO and IITM on 30th July 2021. IMPO also supports the monsoon activities of the Working Group on Tropical Meteorology Research (WGTMR) of the World Weather Research Programme (WWRP), facilitating the MP's linkages with WWRP monsoon activities.

1.2 Monsoons Panel's current main missions

The MP coordinates strategies, advises on plans and defines concrete activities to carry out studies on the suggested research priorities, including selecting, limiting, and concluding such activities as

appropriate. MP encourages studies on priority themes by groups from different monsoon domains and facilitates and/or promotes collaboration among monsoon researchers. MP stimulates the interest of researchers and students in monsoon related problems by supporting and organizing workshops, advanced schools, and promoting scientific sessions in conferences with focus on monsoons. MP also coordinates the formation and function of regional working groups and collaborates with the WCRP and WWRP substructures relevant to monsoon research regarding the organization of scientific meetings and regional working groups, as well as on relevant issues for advancing monsoon research. Finally, MP supports work in cooperation with regional, national, and multinational programs to enhance the understanding of monsoon systems and improve monsoon prediction from synoptic to decadal time scale and longer, setting strategic priorities for long-term climate projection. MP also has a mission to communicate existing products and provide guidance on their (adequate) application and limitations to the operational community, (relevant) impacts community and participate in relevant training activities.

The current goal of the MP is to identify the bottlenecks to further improve the skills of dynamical models in representing the monsoons on multi-spatiotemporal scales, including extreme weather. The activities lined up for addressing these activities include:

- Assess and improve the skill of monsoon rainfall in different regional monsoons and identify the bottlenecks in the dynamical models.
- Improve understanding of dynamical and physical processes associated with extreme events and identifying the lacuna in capturing these extremes in present-day models.
- Promote Research to Operations (R2O) activities to contribute with the Regional Climate Outlook Forums (RCOFs) and operational meteorological services.
- Build capacity by promoting ECS representation in the WGs and subgroups developing these activities

1.3 Monsoon Panel's 2024 Activities

1.3.1 Organizational Activities

The Sixth Session of CLIVAR/GEWEX Monsoons Panel was held on 11th July 2024 during the 9th GEWEX/OSC at Sapporo, Japan in hybrid mode (with 4 members attending in-person and 4 online). A special hybrid meeting of MP and WG-AAM members (with 5 members attending in-person and 7 online) was also organized on 11th July 2024. Xubin Zeng (Co-chair, GEWEX SSG), Francois Engelbrecht (Co-chair, CLIVAR SSG) and Hindumathi Palanisamy (WMO Secretariat) attended the meeting in-person as special invitees and gave their valuable suggestions/comments. Sonya Legg (Co-chair, CLIVAR SSG) also attended the meeting online and gave her valuable comments/suggestions. A photo displaying the session in-progress is given in Appendix-I. The minutes of the session is available in Page “MoM:2024” of Section “MP Meeting Minutes” in the [Monsoons Panel Notebook](#)

In addition, MP held 5 virtual meetings in 2024 (on 23rd January, 4th April, 10th June, 13th September and 12th November), which enabled discussions on the cross-panel activities, 2025 Membership updates, activities of regional WGs and future work plans. A special meeting between the Monsoons Panel (MP) and the Working Group on American Monsoons (WG-AMM) was also held on 20th February 2024 to

understand the issues faces by the working group. The minutes of all meetings are available in Page “MoM:2024” of Section “MP Meeting Minutes” in the [Monsoons Panel Notebook](#)

- WG-AFM held 3 virtual meetings in 2024 (29th February, 30th April and 26th November) to discuss on the writing of a review article on “Climate Modeling of Precipitation over Africa”, the activities of their 3 sub-groups (Viz., South & East Africa, West Africa, and Central Africa) and 2025 Membership revisions.
- WG-AAM held 4 virtual meetings (on 15th January, 2nd May, 12th September and 21st November) to discuss on the activities of the group and its 3 sub-groups (Viz., Monsoon Processes and Teleconnections; R2O for monsoon seasons in SE Asia; High Impact Weather Events), 2025 Membership updates and on the Asian/Australian (summer) Monsoon 2024.
- WG-AMM had email exchanges and a few online meetings among its members to discuss their activities.

MP was actively involved in the selection and appointment of the 3 new members to the panel (Dr. Samson Hagos, Dr. Jhan-Carlo Espinoza and Dr. Satyaban Bishoyi Ratna) in February 2024.

MP was also actively involved in the 2025 membership revisions in WG-AAM, WG-AFM and WG-AMM. The details of the current memberships of MP and the regional working groups are available at the following links:

- CLIVAR/GEWEX Monsoons Panel (14 members; Female: 6, Male: 8)
 - Co-Chairs: Prof. Leila M.V. Carvalho and Dr. Suryachandra Rao Anguluri
 - Webpage: <https://impo.tropmet.res.in/wcrp-monsoon.html>
- Working Group on Asian-Australian Monsoons (17 members; Female: 5, Male: 12)
 - Co-Chairs: Dr. Tieh Yong Koh and Dr. Lin Wang
 - Webpage: <https://impo.tropmet.res.in/mpwg-aam-members.html>
 - 2025 Membership renewal of WG-AAM was approved by MP on 15th October 2024. The 5 new members are:
 - Dr. Hui Su (MP Member from HKUST, China)
 - Dr. Hiroshi Takahashi (MP Member, Tokyo Metropolitan University, Japan)
 - Dr. Tim Cowan (BoM/University of Southern Queensland, Australia)
 - Dr. Zizhen Dong (Yunnan University, Kunming, China)
 - Dr. Maheswar Pradhan (IITM, Pune, India)
 - Five existing members Drs. H. Annamalai, Suryachandra Rao A., Usha Tune, Huqiang Zhang and P. Mukhopadhyay are being rotated off on their request.
- Working Group on African Monsoons (21 members; Female: 8, Male: 13)
 - Co-Chairs: Dr. Rondrotiana Barimalala and Dr. Akintomide Afolayan Akinsanola
 - Webpage: <https://impo.tropmet.res.in/mpwg-afm-members.html>
 - WG-AFM is being reconstituted under the new Co-chairs (Paul-Arthur Monerie and Masilin Gudoshava). An Open Call for new Members to the CLIVAR/GEWEX Monsoons Panel’s Working Group on African Monsoons has been advertised in [IMPO webpage](#) and circulated the advertisement to other networks.
- Working Group on American Monsoons (15 members; Female:6, Male: 9)
 - Co-Chairs: Dr. Alice Grimm (the other Co-chair (Ruth Cerezo-Mota) has resigned)
 - Webpage: <https://impo.tropmet.res.in/mpwg-amm-members.html>

About seventeen (17) members of MP and its regional working groups are early career researchers.

1.3.2 Scientific Activities

- Leila Carvalho (MP Co-chair) participated (online) in the 29th Session of CLIVAR SSG on 29th February 2024 and presented the recent activities of MP and its Regional Working Groups.
- Suryachandra Rao (MP Co-chair) participated in-person in the 36th GEWEX SSG meeting in-person during 22-26 April 2024 in Budapest, Hungary and presented the recent activities of MP and its Regional Working Groups
- Leila Carvalho (MP Co-chair) participated in the 45th WCRP JSC meeting online on 27th May 2024 and presented an update on the activities of MP & IMPO.
- Involvement MP/WG members in [STIPMEX International Workshop](#) held during 3-7 June 2024 at IITM Pune:
 - Leila Carvalho (MP Co-chair) was a member of Scientific Steering Committee (SSC)
 - Dr. Parthasarathi Mukhopadhyay (WG-AAM member) played a key role in the conceptualization of STIPMEX as a member of SSC and in the organization of the workshop a member of Local Organizing Committee (LOC).
 - Suryachandra Rao (MP Co-chair) chaired the [Session X](#) on “New approaches for extreme weather events prediction” on 6th June 2024.
 - Dr. Parthasarathi Mukhopadhyay (WG-AAM member) Co-chaired [Session XIV](#) on Stakeholders’ Discussion on Renewable Energy & Weather Forecasts on 7th June 2024.
 - Dr. Parthasarathi Mukhopadhyay (WG-AAM member) delivered a Lead Oral talk on “A convection permitting model: IITM HGFM to improve High Impact weather prediction” in [Session X](#) on 6th June 2024
 - Dr. Raghavendra Ashrit (WG-AAM member) delivered a Lead Oral online talk on “Extreme Daily Rain: Forecasting & Verification Challenges” in [Session X](#) on 6th June 2024
 - Dr. Satyaban Ratna (MP Member) was member of the LOC of STIPMEX, and he co-chaired the [Session VIII](#) on “Extreme weather events and prediction” 6th June 2024.
- Drs. Suryachandra Rao (MP Co-chair), Hiroshi Takahashi (MP member) and Hugh Zhang (WG-AAM Member) were convenors of the Session 10 of the 9th GEWEX OSC on “[Monsoons \(Special Session celebrating 150 years of IMD\)](#)” which was held on 10th July 2024 at Sapporo, Japan. More details on the session can be found in Appendix-II.
- WG-AFM members (Drs. Akintomide Akinsanola, Aissatou Faye and Ross Dixon) were co-chairs of the Session 13B on “[African Climate Change and Variability](#)” at the 2024 American Meteorological Society (AMS) Annual Meeting, at Baltimore, MD, which provided a platform to share cutting-edge research on African climate systems.
- 4 members of WG-AFM (Drs. Akintomide Akinsanola, Aissatou Faye, Ross Dixon and Ismaila Diallo) and Dr. Samson Hagos (MP Member) participated in the [UCAR Africa Initiative Workshop](#) held during 21-22 March 2024 at Center Green, Boulder, CO, USA and online. Drs. Akintomide Akinsanola and Samson Hagos were Chairs/Facilitators of the Group Discussions on Climate and Weather respectively.
- Dr. Satyaban Ratna (MP Member) as a Secretary of the Indian Meteorological Society-Pune Chapter (IMSP), played a key role in the organization of the Annual Monsoon Workshop to review the Indian Summer monsoon 2024

- Dr. Satyaban Ratna (MP Member) participated (Online) in the [WMO RA II Research Activities workshop held in Beijing, China](#) during 15-17 July 2024 and highlighted the Monsoons Panel activities during the discussions.
- The [8th WMO International Workshop on Monsoons \(IWM-8\)](#) is being organized jointly by the Indian Institute of Tropical Meteorology (IITM), Pune, Ministry of Earth Sciences (MoES), Government of India, the WWRP's Working Group on Tropical Meteorology Research (WGTMR) and the **CLIVAR/GEWEX Monsoons Panel** in cooperation with the India Meteorological Department and the International Monsoons Project Office (IMPO) during 17-21 March 2025 in Pune, India. The involvement of MP/WGs members in IWM-8 are the following:
 - 6 members of the Monsoons Panel (Prof. Leila Carvalho, Dr. Suryachandra Rao Anguluri, Dr. Annalisa Cherchi, Dr. Samson Hagos, Dr. Satyaban Ratna and Dr. Rondrotiana Barimalala), 3 members of WG-AFM (Dr. Akintomide Akinsanola, Dr. Neil Hart and Dr. Masilin Gudoshava), 2 members of WG-AAM (Dr. Tieh-Yong Koh and Dr. Shiromani Jayawardena) and 3 members of WG-AMM (Prof. Alice Grimm, Dr. Caio Augusto dos Santos Coelho and Prof. Michelle Simões Reboita) are playing a key role as the members of the International Scientific Committee (ISC) of IWM-8. These members played an active role in the evaluation of the abstracts submitted to the workshop and few members are identified to deliver Invited Talks in the workshop.
 - Thirty (30) Abstracts with MP/WG members as lead author/co-authors have been accepted for Oral/Poster presentation in the workshop (More details are given in Appendix-III).

Please also see Section 2.2.

2. Achievements for 2024

2.1 Workshops

- *28th South Asian Climate Outlook Forum (SASCOF-28)*: Dr. Suryachandra Rao (MP Co-chair) chaired the session on Seasonal Prediction of South Asian Summer Monsoon 2024: Global and Regional Perspectives on 29th April 2024 at Pune. Dr. Satyaban Ratna (MP Member) was one of the main organizers of SASCOF-28. In coordination with UK Met Office, Dr. Satyaban Ratna (MP Member) also organized a National Framework for Climate Services (NFCS) session for the South Asian country participants during SASCOF-28
- ASEANCOF: The first hybrid ASEANCOF was held in May 2024 in Lao PDR, with one R2O subgroup member attending in person and one online. Mention was made that the working group are progressing with the regional monsoon index, with plans to share at ASEANCOF sessions in 2025. Members will also be invited to attend the ASEANCOF-23 session in November 2024.
- APARC SSG meeting: The [33rd APARC SSG meeting](#) was held in October 2024 in Germany. Dr. Lin Wang from WG attended the meeting on behalf of the Monsoons Panel, delivered a talk to introduce the Monsoons Panel and its activities, and sought potential cross-panel collaborations with the APARC community.

- Members of the MP and working groups were actively involved in the 9th GEWEX OSC:
 - MP Co-chairs (Prof. Leila Carvalho and Dr. Suryachandra Rao) were members of the [Program Committee of OSC](#) for Planning and organizing of the conference program.
 - Drs. Suryachandra Rao (MP Co-chair), Hiroshi Takahashi (MP) and Hugh Zhang (WG-AAM) were convenors of the Session 10 of the 9th GEWEX OSC on “[Monsoons \(Special Session celebrating 150 years of IMD\)](#)” and Drs. Hiroshi Takahashi and Hugh Zhang co-chaired the session held on 10th July 2024.
 - Dr. Hiroshi Takahashi (MP) presented a paper on “Impact of Spring Land-Surface Conditions over the Tibetan Plateau on the Early Summer Asian Monsoon using an AGCM Large Ensemble”.
 - Dr. Samson Hagos (MP) presented a paper on “Horizontal Vorticity Mixing as a Sub-Grid Parameterization for Convection Permitting Models”.
 - Dr. Hugh Zhang (WG-AAM) presented a paper on “CCRS Research towards Improving Modelling and Forecasting Convective Weather over the Maritime Continent”.
 - Dr. Joseph Basconcillo (WG-AAM) presented a paper on “Characterizing the Southwest Monsoon Season in the Philippines Using Multiple Localized Monsoon Indices”.
 - Dr. Shiromani Jayawardena (WG-AAM) presented a paper on “Pre-Monsoon Disturbances and Extreme Rainfall: Enhancing Early Warning Systems in Sri Lanka”.
- Eight members of MP and Working Groups participated (online and In-person) in the *Asian-Australian-African (AAA) Monsoons Programme International Workshop*, organized by the Chinese Academy of Meteorological Sciences, China Meteorological Administration, Qingdao, China, on 19th November 2024. The workshop discussed on the Asian-Australian-African Monsoons Programme and members contributed with comments on the influence of the variability of the AAA monsoons via teleconnections. It was an interesting workshop as it allowed exchanges of information between experts from different monsoon systems that are interconnected. *Drs. Alice Grimm (Co-chair, WG-AMM) and Ajayamohan Ravindran (MP Member) attended in person. Drs. Suryachandra Rao (MP Co-chair), Thea Tukington (MP/WG-AAM Member), Satyaban Bishoyi Ratna (MP Member), Rondrotiana Barimalala (MP/WG-AFM Member), Hiroshi Takahashi (MP Member) and Parthasarathi Mukhopadhyay (WG-AAM member) attended online.*

Please also see Section 2.2.

2.2 *Scientific Results from Activities*

- **Scientific Results from WG-AAM**
 - Monsoon Processes and Teleconnections (MPT) subgroup:
 - The ways to proceed with the scientific collaborations within the subgroup were identified to be based on ongoing research and projects of subgroup members with contributions to subgroup members or larger communities who have interest. Three potential directions of collaboration that were identified are:
 - a) Teleconnections between Arctic Sea ice and East Asian cold extremes,
 - b) Influences of cold surge on East and Southeast Asia with new cold surge features
 - c) Monitoring and understanding heavy rainfall (including typhoons) over Southeast Asia and Northwestern Pacific.

- Research to Operations for monsoon seasons in SE Asia (R2O) subgroup:
 - A Southeast Asian Monsoon Index has been developed to characterize the onset, progress and termination of summer and winter monsoons in Southeast Asia. The results were presented at the 9th GEWEX OSC meeting held in Sapporo, Japan, in July 2024 a WG member. One paper based on this work is under preparation for submission to an international journal by the end of 2024. This work is currently extended by re-examining the persistence and strength of monsoon winds in the delineation of the progression of monsoon peaks in Southeast Asia.
- High Impact Weather Events (HIW) subgroup
 - Development of a paper currently titled “What makes a good weather warning?”, aiming for a completed draft in Q1 2025. The aim of the paper is to cross-compare weather warnings released by national met agencies across monsoonal Asia. They have brought on board a number of employees from these agencies and have made good progress on a paper draft, which includes comparison of warnings for specific event types (e.g., heatwaves and tropical cyclones) as well as summary tables for website structure and traffic for each agency. They will conclude with a detailed discussion noting both common themes (good or bad!) and best practices, as well as difficulties faced by agencies and our recommendations for the future.
- Documenting the unusual characteristics of monsoons 2022 and 2023
 - Following on from previous discussions on the unusual characteristics of the 2022 summer monsoon season, and since 2023 was also a somewhat unusual year for the boreal summer monsoons, a specific activity was undertaken to compare and contrast the boreal summer monsoons in these two years. An article was written by a subset of the WG members, led by Dr Ajaya Mohan, and submitted on behalf of the WG-AAM to GEWEX Quarterly for publication in the autumn edition and is now published. An abstract on this has also been submitted to the IWM-8.
- Reviewing the Asian Australian monsoons in 2024
 - As part of the WG’s continued monitoring and discussing of the boreal and austral monsoon conditions, extreme events, and large-scale drivers for the Asian Australian monsoon region, a special meeting was held on 21st November 2024 to review the monsoons in 2024.
- ***Scientific Results from WG-AFM:***
 - The West Africa Subgroup made substantial progress in analyzing the representation of mesoscale convective systems over West Africa using DYAMOND data. Key findings are now available, offering valuable insights into convective system dynamics in this region.

2.3 Scientific Capacity Building and Career Support

- WG-AFM played a key role in the successful organization of the Joint WCRP/ WWRP Webinar Series on African Monsoons, held online on 6th March 2024, which featured talks by eminent scientists, Prof. Prof. Michela Biasutti (Climate Change in the Sahel: The Past and the Future) and Dr. Samson Hagos (Synchronization of the Recent Decline

of East African Long Rains and Northwestern Asian Warming). The WG-AFM Co-chairs Drs. Rondrotiana Barimalala and Akintomide Akinsanola co-chaired the webinar. A screenshot of the in-progress webinar is displayed in Appendix-IV. Out of the 138 registered attendees, 74 attended the webinar. [Video recording](#) of the webinar has been made available in IITM YouTube channel for wider reach & publicity, which has 240 views till date.

- WG-AMM played a key role in the successful organization of the Joint WCRP/ WWRP Webinar Series on American Monsoons, held online on 24th April 2024, which featured talks by eminent scientists, Prof. Pedro Leite da Silva Dias (Challenges for the South American monsoon predictability) and Dr. Salvatore Pascale (The North American monsoon: current scientific issues and perspective for the future). Prof. Alice Grimm (WG-AMM Co-Chair) chaired the webinar. A screenshot of the in-progress webinar is displayed in Appendix-IV. Out of the 126 registered attendees, 53 attended the webinar. [Video recording](#) of the webinar has been made available in IITM YouTube channel for wider reach & publicity, which has 134 views till date.
- Dr. Lin Wang helped to organize a domestic Young Scientist Workshop on Extreme Weather and Climate Events in September in Beijing. The workshop reviewed the 2024 summer monsoon status and its prediction, as well as dynamics and new tools and technologies in monsoon observation, research, and prediction.
- An early-career scientist activity was organized during the ICDM Workshop 2024 in October in Beijing, where Dr. Lin Wang was a co-chair of the workshop. About 50 early-career scientists communicated with nine senior and mid-career scientists face-to-face in three groups. The discussed topics include but are not limited to paper writing, selection of research topics, career development, and balance between work and life, especially for female scientists.
- Under the CBIT (Capacity Building Initiatives for Transparency) project, Dr Shiromani Jayawardena (WG-AAM) conducted several workshops and training sessions to strengthen climate data monitoring, reporting, and adaptation strategies. The focus remains on equipping officials with advanced data tools and methodologies to meet transparency and adaptation goals, particularly in the Agriculture, Forestry, and other land use (AFOLU) sectors in Sri Lanka, aligned with the Paris Agreement.
- Michelle Reboita (WG-AMM) is a coordinator of "Environmental Connection", a radio program in FM band to discuss environmental topics. The programs are recorded and here is one example: <https://conexaoitajuba.com.br/defesa-civil-alerta-para-possibilidade-de-fortes-chuvas-em-itajuba-e-regiao/>

2.4 Knowledge exchange

- Several of the WG-AAM members are regular contributors to the Regional Climate Outlook Forums for the Asian Australian region (SASCOF, ASEANCOF), allowing the group to provide guidance on model strengths and weaknesses and to reach out to stakeholders.
- Several WG-AAM members attended and presented at the GEWEX Open Science Conference in Sapporo, Japan, 7-12 July 2024, with 4 being funded by CLIVAR/GEWEX.
- The WG-AAM has been supporting the Monsoons Panel activity to compile a special issue on the Global Monsoons for Advances in Atmospheric Sciences. Some papers have been submitted. In addition,

- Dr. Lin Wang is working on a review of the Asian summer monsoon
 - Dr. Hiroshi Takahashi is working on a review about land-atmosphere interactions over the Asian monsoons.
 - Dr. Tim Cowan will be approached for a review of the Australian monsoon.
 - The APARC/ACAM group might contribute, and the WG may encourage some of the IWM-8 contributors to submit papers to the AAS collection.
- Several WG-AAM members attended and presented at the [AOGS 2024 at Pyeongchang, Gangwon-do, South Korea](#) during 23-28 June 2024.
 - 5 MP members and 8 WG members joined the International Scientific Committee (ISC) for the Eighth WMO International Workshop on Monsoons (IWM-8) being during 17-21 March 2025 at Pune, India. They were involved in the evaluation of submitted abstracts to IWM-8.
 - Suryachandra Rao (MP) delivered a talk on “[Monsoon Forecasts: Skills and Bottlenecks](#)” in the workshop on [Moist Convective Dynamics of Monsoons](#) organized by The International Centre for Theoretical Sciences (ICTS), Bengaluru on 27th November 2024 for Students/ECRs.
 - 6th Meteorological Week UFSM: Dr. Michelle Reboita (WG-AMM) delivered an online talk “Efeito das mudanças climáticas nos sistemas atmosféricos que atuam na América do Sul”, on 21 Mar 2024 (<https://www.youtube.com/watch?v=bUEWebWiQKc>)
 - EGU General Assembly 2024, European Geosciences Union, Vienna, 14-19 April 2024: Dr. Alice Grimm (WG-AMM) delivered the oral presentation “Towards robust and actionable information on monsoon climate change in South America. Abstract EGU24-13343, Oral Session AS1.18 – Monsoon systems in a changing climate: past, present and future.
 - DHN - Marinha do Brasil: Michelle Reboita delivered a talk online with title: “Teleconexões e Previsão Sazonal do Clima”, on 20th September 2024 (Videoconferência sobre o tema Previsão Climática-20240920 1444-1.mp4)
 - 15th International Meeting on Statistical Climatology (IMSC), 24-28 June 2024, Centre International de Conférences, Meteo-France: Dr. Iracema Cavalcanti (WG-AMM) presented the paper “Verification of extreme wet and dry cases in Brazil predicted by ECMWF S2S model”.
 - Seminar “Extreme Weather Events and the Crisis in Rio Grande do Sul, Brazilian Intelligence Agency (ABIN), Curitiba, April 7th, 2024: Dr. Alice Grimm (WG-AMM) presented the invited talk: Extreme Weather Events and the Natural Disaster of May/2024 in Rio Grande do Sul.
 - Involvement of WG-AMM members in the Pan-American Meteorology Conference (CPAM 2024), Sao Paulo, Brazil, 19-23 August 2024:
 - 1) Dr. Marcelo Barreiro delivered the invited talk “Variability and predictability of the South Atlantic Convergence Zone on subseasonal time scales”.
 - 2) Dr. Alice Grimm delivered the invited talk “The South American Monsoon: variability and prediction challenges” in session ST03 (Climate Variability and Influence on the Americas).
 - 3) Dr. Alice Grimm presented the paper “Selection of the best statistical distribution to compute the SPI (Standardized Precipitation Index) for determining precipitation extremes in basins contributing to hydroelectric plants of the Brazilian National Interconnected System (SIN)”.

- 4) Dr. Iracema Cavalcanti presented the paper “Droughts in South America and associated processes during austral summer”.
 - 5) Dr. Michele Reboita delivered an invited talk in session ST08 (Climate Projections in the Americas)
 - 6) Dr. Michele Reboita presented the paper “Identificação de eventos secos e úmidos hidrológicos na região SAM-IPCC”.
- CPTEC-INMET-FUNCEME-CENSIPAM Climate Prediction meetings (Online): Dr. Felipe Marques (WG-AMM) has been participating in the monthly meetings.
 - Workshop of the R&D&I Climate Change Program “Innovative Ideas to Transform Tomorrow”, Engie Brazil Energy S.A., Florianopolis, 9th September 2024: Dr. Alice Grimm (WG-AMM) delivered an invited lecture on “How can anthropogenic climate change affect monsoon rainfall in Brazil?”

2.5 Cross-panel Activities

- Dr. Satyaban Ratna (MP Member) as a member of [CLIVAR Climate Dynamics Panel \(CDP\)](#) and [CLIVAR Pacific Atmospheric Teleconnections in a wArming Climate \(PATAc\)](#) working Group, contributed to monsoon discussions.
- Wei Ting Chen and Lin Wang of WG-AAM joined the SPARC activity on Atmospheric Composition and the Asian Summer Monsoon (ACAM).
 - Dr. Lin Wang participated in the [33rd APARC SSG meeting](#) at Forschungszentrum Jülich, Germany on 28th October and presented on “Collaboration Potentials between APARC/ACAM & CLIVAR/GEWEX Monsoons Panel”.
- Following the recommendations of the CLIVAR SSG for MP’s involvement in [Quantitative evaluation of the Indian Ocean Observing System to improve climate forecasts \(QIndOOS\)](#), a cross-panel discussion meeting was held on June 12, 2024, with Elisabeth Remy from the [SynObs Project](#)’s [Observing System Evaluation Task Team](#) and Dr. Suryachandra A. Rao (MP) to evaluate the Ocean Observing System. Under this cross-panel activity with the impact of different ocean observations on model simulations, particularly of Asian monsoon and Indian monsoon is being examined.
- Drs. Hui Su and Hiroshi Takahashi of MP are collaborating with CliC on understanding the connections between the Himalayan cryosphere and Asian monsoons & Impacts of reduced Arctic sea-ice on Asian monsoons.
- Drs. Michelle Reboita, Parthasarathi Mukhopadhyay and Hatsuki Fujinami are members of WWRP/WGTMR (Working Group on Tropical Meteorology Research).
- Dr Joseph Basconcillo of WG-AAM has volunteered for GPEX LHA.
- WG-AFM is co-designing the Africa case study with the EPESC lighthouse activity.
- Masilin Gudoshava (WG-AFM) is involved in the “My Climate Risk” lighthouse activity and Izidine Pinto in “Safe Landing Climates.”
- Caio Coelho (WG-AMM) is a member of the Expert team on Climate Services Information System Operations, co-chair of the Expert team on Operational Climate Prediction System, and co-chair of the Joint Working Group of Forecast Verification Research
- Annalisa Cherchi (MP) contributed to cross-panel activities as member of the SSG (interim) of the GPEX that has been recognized as a new WCRP LHA.

- 3 MP members (Drs. Annalisa Cherchi, Hui Su and Samson Hagos) participated in GPEX meeting held in Washington DC during 6-7 December 2024. From 1st January 2025, they will be effective members of GPEX with Dr. Annalisa Cherchi as GPEX Co-chair, Dr. Hui Su as Co-chair of WG2 (Data development) and Dr. Samson Hagos as Co-chair of WG1 (Coordinated field campaigns).
- On an invitation from CLIVAR/ IOC-GOOS Indian Ocean Regional Panel (IORP), Suryachandra Rao (MP) made a presentation on the skill of the models in predicting Asian monsoon, especially Indian summer monsoon. As a follow-up IORP and WG-AAM will work together to create a document suggesting the future requirements to improve the monsoon prediction skill. Maheswar Pradhan (new Member WG-AAM) will also be associated in it.

3. Plans for 2025 and Beyond

- WG-AAM membership has been reviewed and 12 members requested renewal of their terms while 5 members are rotated off. 5 new members were invited to join, two of whom are currently members of the Monsoons Panel who have been engaging regularly with the WG and their 3-year term will begin from January 2025.
- WG-AAM co-chairs are due to rotate off in December 2024 and July 2025. Two new co-chairs have been identified and proposed to the Monsoons Panel. Dr Lin Wang will take over from Dr Gill Martin in January 2025 and Dr Thea Turkington will take over from Dr Tieh Yong Koh in July 2025.
- WG-AAM's Subgroup activities will continue and aim to publish results of work from the past 1-2 years.

Monsoon Processes and Teleconnections Subgroup:

- To start the joint research on teleconnections between the Arctic Sea ice and East Asian cold extremes.
- To analyze the influences of cold surge on East and Southeast Asia with new cold surge features.
- To start joint research on monitoring and understanding heavy rainfall (including typhoons) over Southeast Asia and Northwestern Pacific.

Research-to-operations for monsoon seasons in SE Asia Subgroup:

- To handle post-submission reviews and present the paper, "Introduction of Wind-based SEA Monsoon Index"
- To write up and submit the paper, "SEA Monsoon Characterization using wind-based SEA Monsoon Index"
- To disseminate and collect feedback on our SEA Monsoon Index in ASEANCOF in 2025. A separate webinar may subsequently be organised to involve operational forecasters on the use of SEA Monsoon Index.
- To verify the skill of our SEA Monsoon Index regarding monsoon seasons' onset, peak, termination and strength.
- To explore the use of SEA Monsoon Index to analyse changes in the region's monsoon under climate change scenarios using SingV3 8-km outputs from Meteorological Service Singapore.

High-impact weather event Subgroup:

- Completion of the weather warning paper draft, followed by feedback from the larger AAMWG and then submission.

- Possible development of a second paper focusing on one particular case (e.g., of a tropical cyclone with compound flood/wind hazards) that affected multiple countries. This will compare forecasts and warnings issued by, and actions taken by, the affected NHMSs. A potential target is Typhoon Yagi.
- Six (6) WG-AAM members will participate in-person in the IWM-8 during 17-21 March 2025 and present the following papers:
 - “Asian Summer Monsoon Variability during 2022–2023: Beyond Canonical Teleconnection Patterns” submitted on behalf of the WG-AAM will be presented as an Oral Talk by Thea Turkington
 - “Southeast Asian Monsoon Index for Its Monitoring and Prediction” submitted on behalf of R2O subgroup of WG-AAM will be presented as an Oral Talk by Thea Turkington
 - “Post-Onset Heavy Rainfall Events and Their Impacts in Southwestern Sri Lanka: A Comparative Analysis of Atmospheric Conditions in 2021 and 2024” submitted by Shiromani Jayawardena and will be presented as a Poster presentation
 - Kieran Hunt has submitted two abstracts and one has been selected for Oral and the other for Poster presentation.
 - “Using regional relaxation experiments to understand the development of errors in the Asian Summer Monsoon” will be presented as an Oral talk by Gill Martin.
 - “Cloud and Convection Patterns Driven by Diurnal Ocean Warming” will be presented as an Oral Talk by Maheswar Pradhan.
- Three (3) WG-AFM members will participate in-person in the IWM-8 during 17-21 March 2025 and present the following papers:
 - “Investigating the Drivers of Dry Season Rainfall over Eastern Africa” will be presented as a poster by Caroline Wainwright
 - “Southern African Monsoon: climatology and combined effect of SST interannual variability modes” will be presented as a poster by Kenedy C. Silverio
 - “Model uncertainty in future changes in West African precipitation: component replication” will be presented as an Oral talk by Paul-Arthur Monerie.
- WG-AMM will enlarge the scope of the AAS special issue on South American monsoons, including articles on the North American monsoons, if North American members of the WG wish to participate.
- Three (3) MP members will participate in-person in the IWM-8 during 17-21 March 2025 and deliver the Invited/Oral talks:
- WG-AMM will be restructured with new Co-chairs, and then discuss the future plans.

4. Articles Published in 2024 as part of MP Activities (if any)

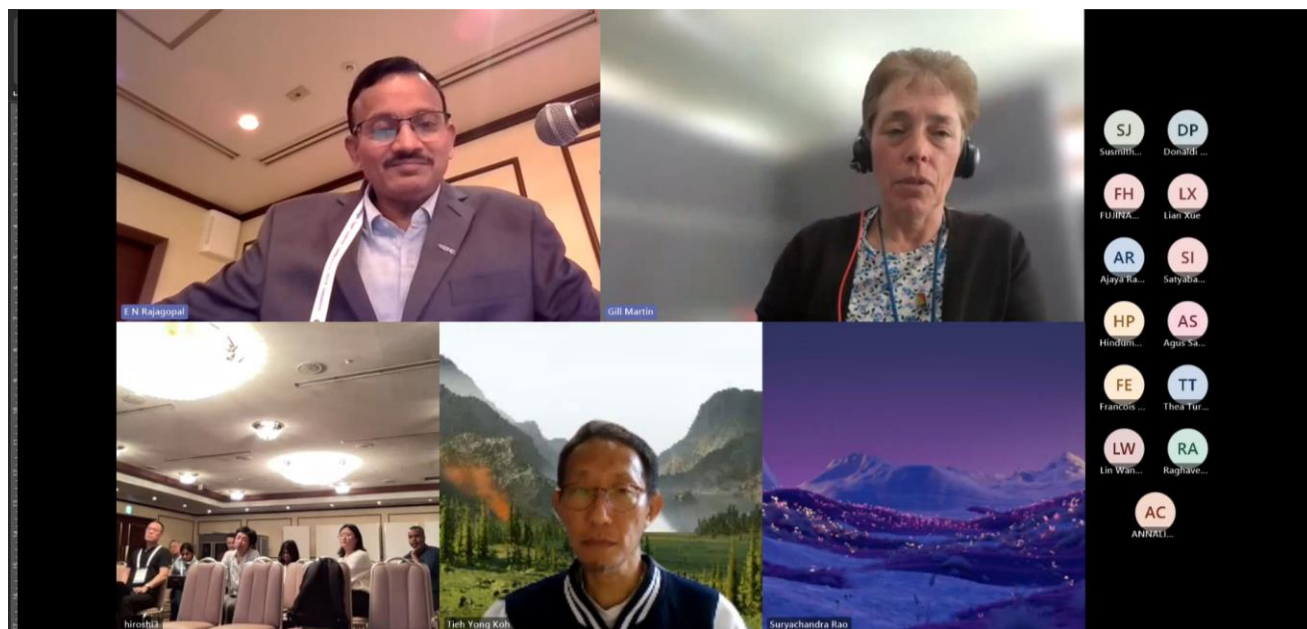
- a) Akinsanola AA, Wenhaji CW, Barimalala R, Monerie P-A, Dixon RD, Tamoffo AT, Adeniyi MO, Ongoma V, Diallo I, Gudoshava M, Wainwright CM, James R, Silverio KC, Faye A, Nangombe S, Pokam MW, Vondou DA, Hart NCG, Izidine Pinto, Kilavi M, Samson Hagos, Rajagopal EN, Rupa Kumar Kolli, Joseph Susmitha, 2024: "Modeling of Precipitation over Africa: Progress, Challenges, and Prospects", *Advances in Atmospheric Sciences*. <http://www.iapjournals.ac.cn/aas/article/doi/10.1007/s00376-024-4187-6>.

- b) Ajayamohan, R.S., Gill Martin, Thea Turkington, Hatsuki Fujinami, Joseph Basconcillo, H. Annamalai, Shiromani Jayawardena, Raghavendra Ashrit, Hiroshi Takahashi, and Tieh Yong Koh, on behalf of the CLIVAR/GEWEX Regional Working Group on Asian Australian Monsoons, 2024: “Asian Summer Monsoon Variability during 2022–2023: Beyond Canonical Teleconnection Patterns”, *GEWEX Quarterly, Vol. 34, No. 3 Quarter 3, 2024*.
- c) **Rao, V. B.**; Bhargavi, V. S. L.; Rosa, M. B.; **Reboita, M. S.**; **Grimm, A. M.**, 2024: A comparison of Indian and South American monsoon variability and likely causes. *Theoretical and Applied Climatology, Vol. 155, 3505–3523* <https://doi.org/10.1007/s00704-024-04870-5>
- d) **Cavazos, T.**; Bettolli, M.L.; Campbell, D.; Sánchez Rodríguez, R. A.; Mycoo, M.; Arias, P. A.; Rivera, J.; **Reboita, M. S.**, Gulizia, C.; Hidalgo, H. G.; Alfaro, E. J.; Stephenson, T. S.; Sörensson, A. A.; **Cerezo-Mota, R.**; Castellanos, E.; Ley, D.; Mahon, R., 2024: Challenges for climate change adaptation in Latin America and the Caribbean region. *Front. Clim. Vol.6*. <https://doi.org/10.3389/fclim.2024.1392033>
- e) Cross-panel publications between MP/WG members with WGNE and Fresh Eyes on CMIP Member (Ankur Srivastava)
 - i) Keane, R. J., Srivastava, Ankur, and **Martin, G. M** (2024): Development of Indian summer monsoon precipitation biases in two seasonal forecasting systems and their response to large-scale drivers, *Weather and Climate Dynamics*, <https://doi.org/10.5194/egusphere-2023-2653>.
 - ii) P. M. Dhage, Ankur Srivastava, **Suryachandra A. Rao**, A. Soni, and **M. Pradhan** (2024). “Applicability of seasonal forecasts from dynamical models for reservoir management practices”, *Mausam*, vol. 75, no. 2, pp. 559–572, <https://doi.org/10.54302/mausam.v75i2.6229>.
 - iii) Ankur Srivastava, **Suryachandra A. Rao**, Subimal Ghosh (2024). “Impact of river freshwater on subseasonal to seasonal variability in a climate model Research activities in Earth system modelling”. Working Group on Numerical Experimentation. WCRP Report No.12/2024. WMO, Geneva. <https://wgne.net/bluebook/>
 - iv) **Maheswar Pradhan**, Ankur Srivastava, **Suryachandra A. Rao** (2024). “Soil Moisture Feedback over Wet vs. Arid Regions of India”. Working Group on Numerical Experimentation. WCRP Report No.12/2024. WMO, Geneva. <https://wgne.net/bluebook/>

5. Budget and Other Needs for 2025 (in CHF)

Please keep in mind that the overall budget of CLIVAR is limited and this needs to be distributed between all activities and the SSG meeting.

- MP would like to convene an in-person meeting of MP members on the sidelines of the Pan-CLIVAR Meeting in Bali, during 22-26 September 2025. For more details pl. read Annex-A.



Photos of the in-progress Sixth Session of CLIVAR/GEWEX Monsoons Panel held in hybrid mode on 11th July 2024 at Sapporo, Japan

Session 10

Monsoons: Special Session Celebrating 150 Years of India Meteorological Department

Location: Clover (morning) and Myabi (afternoon)

Conveners: Mrutyunjay Mohapatra, Raghavan Krishnan, Suryachandra Rao, Hugh Zhang, Hiroshi Takahashi

Weather & Us – 150 Years of IMD: A Journey Unfolded – (video)

Time	Title	Presenter
10:30–10:45	Zonal Asymmetric Response Of Northern Hemispheric Monsoon To Global Warming	HE, Chao
10:45–11:00	East Asian Atmospheric Rivers Are Most Hazardous In Summer	SON, Seok-Woo
12:30–13:30	Lunch and Poster viewing	
11:00–11:15	Impact Of Spring Land-Surface Conditions Over The Tibetan Plateau On The Early Summer Asian Monsoon Using An AGCM Large Ensemble	TAKAHASHI, Hiroshi
11:15–11:30	Precision In Monsoon Precipitation Forecasting: Evaluating High-Resolution Atmospheric Models Over South Asian Countries	DAS, Mohan Kumar
11:30–11:45	Monsoon Onset Mechanism And Its Reproducibility In Global Climate Models	KAJIKAWA, Yoshiyuki
11:45–12:00	Robust Intensification Of The Indian Summer Monsoon Cross-Equatorial Flow Under Global Warming In A "Zoom Simulation" Of A Global Atmospheric GCM	RAGHAVAN, Krishnan
12:00–13:30	Lunch and Poster viewing	

Time	Title	Presenter
15:00–17:15	Coffee/Tea Break and Poster Viewing	
17:15–17:30	Unique Features Of The Philippines Monsoon Rainfall: Role Of Weak Cyclonic Vortices To The Rainfall And Rainfall Extremes	MATSUMOTO, Jun
17:30–17:45	A Critical Role Of The Cloud-Radiation-Surface-Temperature Feedback For The Damping Of The Madden-Julian Oscillation Over The Maritime Continent Islands	JIANG, Xianan
17:45–18:00	Using An Onset Period Approach To Understand Future Changes In The Dry-To-Wet Season Transition	ZILLI, Marcia
18:00–18:15	A Mechanistic Understanding Of Rainfall Intensification Over Western India And Its Linkage To The Indian Ocean Dipole	MUKHERJEE, Sumit
18:15–18:30	Evaluation Of The Isotope-Enabled Fully Coupled Model MIROC6-Iso And Application On Asian Monsoon	LI, Yifan
18:30–18:45	Divergent Mechanisms, Convergent Responses: A Comparative Analysis Of Extreme Precipitation In Maritime Continent Under Land Use Changes And Global Warming	HSU, Jie



Accepted Abstracts from Monsoons Panel and Working Group Members in IWM-8

Sl. No.	Name	Country/WG	ECR (Y/N)	Title of Paper	Acceptance Status
1	Caroline Wainwright	UK/WG-AFM	Y	Investigating the Drivers of Dry Season Rainfall over Eastern Africa	Poster
2	Kenedy C. Silverio	Mozambique & Brazil/ WG-AFM	Y	Southern African Monsoon: climatology and combined effect of SST interannual variability modes	Poster
3	Maheswar Pradhan	India/ WG-AAM	Y	Cloud and Convection Patterns Driven by Diurnal Ocean Warming	Oral
4	Paul-Arthur Monerie	UK/WG-AFM	N	Model uncertainty in future changes in West African precipitation: component replication	Oral
5	Gill Martin	UK/WG-AAM	N	Using regional relaxation experiments to understand the development of errors in the Asian Summer Monsoon	Oral
6	R. S. Ajayamohan	USA/MP	N	Asian Summer Monsoon Variability during 2022-2023: Beyond Canonical Teleconnection Patterns	Oral
7	Kieran M R Hunt	UK/WG-AAM	N	Wetter, weaker, and more frequent monsoon low-pressure systems in CMIP6 future scenarios	Oral
8	Kieran M R Hunt	UK/WG-AAM	N	Building and interpreting a data-driven energy demand model for Indian states	Poster
9	Thea Turkington	Singapore/ WG-AAM	N	Southeast Asian Monsoon Index for Its Monitoring and Prediction	Oral
10	Annalisa Cherchi	Italy/MP	N	Global and regional monsoons in a changing climate	Oral
11	Samson Hagos	USA/MP	N	Modulation of the Precipitation over the Maritime-Continent and MJO propagation by the Warming of the Congo Basin	Poster
12	Iracema F.A. Cavalcanti	Brazil/ WG-AMM	N	The subseasonal prediction of extreme precipitation in several regions of the South American Monsoon	Oral
13	Shiromani Jayawardena	Sri Lanka/ WG-AAM	N	Post-Onset Heavy Rainfall Events and Their Impacts in Southwestern Sri Lanka: A Comparative Analysis of Atmospheric Conditions in 2021 and 2024	Poster
14	Hiroshi G. Takahashi	Japan/MP	N	GPC/m: Global Precipitation Climatology by Machine Learning; Quasi-global, Daily, and One Degree Spatial Resolution	Poster

15	Hiroshi G. Takahashi	Japan/MP	N	Intraseasonal and interannual precipitation variability associated with the tropical disturbance activity along the monsoon trough	Poster
16	Satyaban Ratna	India/MP	N	Exploring the Combined Influence of ENSO, IOD, and MJO on the Indian Summer Monsoon Dynamics	Oral
17	Kimberly Manauis Co-author: Joseph Q.Basconcillo	Philippines/ WG-AAM	Y	Application of the Local Southwest Monsoon Index in Forecasting Enhanced Monsoon Activity: A Case Study of Super Typhoon Gaemi (2024)	Poster
18	Glauber Willian de Souza Ferreira Co-author: Michelle Simões Reboita	Brazil/ WG-AMM	Y	Projected lifecycle of the South American monsoon using statistical downscaling with CMIP6–GCMs	Oral
19	Anthony Mwanthi Co-author: Masilin Gudoshava	Kenya/ WG-AFM	Y	Preparing for the ‘Next’ Heatwave in Eastern Africa	Poster
20	Ankur Srivastava Co-authors: Surya, Gill Martin, Maheswar Pradhan	India/MP/ WG-AAM	Y	Interactions between the triple dip La-Niña, Indian Summer Monsoon and the Indian Ocean Dipole	Oral
21	Renu S Das Co-authors: Surya, Maheswar Pradhan	India/MP/ WG-AAM	Y	Influence of flux algorithm on Surface Heat Flux during Indian Summer Monsoon	Poster
22	Renu S Das Co-author: Surya	India/MP/	Y	The Role of South-West Indian Orography in Shaping Monsoon Dynamics: Regional and Global Perspectives	Poster
23	Arya V B Co-author: Surya	India/MP	Y	Exploring the Link between Cloud Characteristics and the Dynamics of Extreme Rainfall Events through Satellite Observations and Model Simulations	Poster
24	Subhrajit Rath Co-author: Surya	India/MP	Y	Use of AI/ML in Improvement of Cloud Fraction Parametrization in Rapid Radiative Transfer Model (RRTM)	Poster
25	Moumita Bhowmik Co-author: Surya	India/MP	N	Importance of Modified Convective Microphysics on the Simulation of Indian Summer Monsoon Rainfall and Radiation in the Coupled Climate Model	Poster
26	Aruni Abeysekera Co-author: Shiromani Jayawardena	Sri Lanka/ WG-AAM	Y	An Assessment of the Combined and Independent Impacts of ENSO and IOD on Rainfall Deviation Driven MahaSeason Paddy Cultivation in Sri Lanka	Oral

27	Kavinda Rathnayaka Co-author: Shiromani Jayawardena	Sri Lanka/ WG-AAM	Y	Influence of Indian ocean dipole on westerly wind bursts in the Indian ocean during South-West Monsoon	Poster
28	Ramindi Wijesinghe Co-author: Shiromani Jayawardena	Sri Lanka/ WG-AAM	Y	A comparative analysis of the wind and significant wave height on extreme weather events in the sea of Sri Lanka	Poster
29	Snehlata Tirkey Co-author: Parthasarathi Mukhopadhyay	India/ WG-AAM	Y	A Stochastic and unified convection parameterization approach in the Global Forecast System for predicting monsoon extremes	Oral
30	Tanu Sharma Co-author: Satyaban Ratna	India/MP	Y	Influence of Tropical Climate Drivers on Indian Summer Monsoon Rainfall.	Poster



A screenshot of the Third Joint WCRP/WWRP CLIVAR/GEWEX Monsoon Panel Webinar Series on African Monsoons held on 6th March 2024



A screenshot of the Fourth Joint WCRP/WWRP CLIVAR/GEWEX Monsoon Panel Webinar Series on American Monsoons held on 24th April 2024

**Proforma for CLIVAR Panel and Working Group requests
for SSG approval for meetings**

1. Panel or Working Group: [CLIVAR/GEWEX Monsoons Panel \(MP\)](#)
2. Title of Meeting or Workshop: [Seventh Session of the Monsoons Panel and Cross-panel meetings with other CLIVAR panels](#)
3. Proposed venue: [Bali, Indonesia \(co-located with Pan-CLIVAR-2025 meeting\)](#)
4. Proposed dates: [22-26 September 2025](#)
5. Proposed attendees, including likely number: [7 Members of MP](#)
6. Rationale, motivation and justification, including relevance to CLIVAR themes & JSC cross cutting topics and any cross-panel/working group links and interactions involved:
 - [Cross-panel meetings with other CLIVAR panels interested in monsoons will be one of the main focused activities.](#)
 - [Hybrid meeting of MP members will also be a high priority activity](#)
 - [It may be noted that the In-person meeting between MP and WG-AFM at WCRP OSC at Kigali was a great success \(Ref: The minutes of the \[Fifth Session of MP\]\(#\)\).](#)
 - [It may also be noted that the Sixth Session of the Monsoons Panel \(MP\) along with the Joint Meeting of MP and Working Group on Asian-Australian Monsoons \(WG-AAM\) held alongside GEWEX OSC at Sapporo, Japan on 11th July 2024 was a grand success \(Ref: The minutes of the \[Sixth Session of MP\]\(#\)\)](#)
 - [Efforts will also be made to explore collateral funding by members who have access to alternate resources.](#)
 - [Due to delay in the allocation of Travel Support \(\\$5000\) for the participation in IWM-8, members have obtained collateral funding for the same. Hence, as the current allocation will not be fully used, it is proposed to utilize the balance amount for the Pan-CLIVAR meeting.](#)
7. Specific objectives and key agenda items:
 - [Review of MP's work including the joint CLIVAR/ GEWEX context, Cross-panel Interactions with other CLIVAR Panels, and planning of future activities and deliverables.](#)
8. Anticipated outcomes (deliverables):
 - [Updated Work Plan of the MP and its regional working groups, associated deliverables, outlines of contributions to WCRP Strategic Plan.](#)
 - [Successful Cross-panel interactions with other CLIVAR panels on monsoon related aspects.](#)
9. Format: [Hybrid \(Face-to-Face with provision for remote participation of members unable to travel\)](#)
10. Science Organizing Committee (if relevant): [TBD](#)
11. Local Organizing Committee (if relevant): [TBD](#)
12. Proposed funding sources and anticipated funding requested from WCRP: [15000 CHF](#)
 - [CLIVAR – 15000 CHF](#)