ICPM led sessions at BACO-25

Abstract Submission/ Grant Application Deadline: 15 February 2025



M11 Polar weather and climate extremes

Convener(s)

Tracy Moffat-Griffin (British Antarctic Survey, UK)

Co-Convener(s)

Jonathan Wille (ETH Zurich, Switzerland)

Diana Francis (Khalifa University, UAE)

Minghu Ding (Chinese Academy of Meteorological Sciences, China)

Description

Record-shattering weather extremes are occurring more frequently across the world. Over Polar Regions, similar weather extremes receive less attention, but cause events with global sea-level rise implications. The latest IPCC report states that in a warming climate, globally it is expected that there will be an increase in frequency and intensity of weather extremes. Thus, it is essential to understand the drivers of these short-term Polar weather extremes and their often long-term impacts. This session invites presentations on studies that examine Polar weather and climate extremes, including both past events and future predictions, and their subsequent impacts

JMC14 Climate Change in the Polar Regions: Observing, Modelling and Predicting High Impact Transitions

Convener(s)

David Reusch (University of Washington, USA, IAMAS)

Co-Convener(s)

Tom Bracegirdle (British Antarctic Survey, UK) Pranab Deb (Indian Institute of Technology, India) Amelie Kirchgaessner (British Antarctic Survey, UK) Gareth Marshall (British Antarctic Survey, UK) Richard Essery (University of Edinburgh, UK)

Description

Over recent decades the polar regions have experienced some of the most profound climatic changes on Earth including: rapid regional atmosphere/ocean warming with unprecedented record extremes, changing precipitation amount and phase, decreases in sea ice extent and snow cover, thawing permafrost, and ice-sheet mass loss and disintegration of ice shelves. Understanding the processes and forcings behind these past changes is key to gaining skill and confidence in estimating future change in the climate system. New observations and improvements to observational methods, climate model evaluation against observations, new and old, and improvements in modelling are all critical to achieving this goal. This session will focus on Arctic and Antarctic climate change (on annual to multi-decadal timescales) over the last century and possible changes to come in a world of increasing anthropogenic/climate forcing. We welcome presentations on: changes detected in high latitude in-situ observations; explaining recent trends in sea ice and assessing potential future responses; modelling recent and future climates of the polar regions; high latitude modes of climate variability; impact of tropical climate variability on high latitudes; extreme events and their contribution to underlying climate trends; and the implications of current and future polar change for the rest of the planet.

JMC15 High latitude field campaigns

Convener(s)

Tracy Moffat-Griffin (British Antarctic Survey, UK, IAMAS)

Co-Convener(s)

Olaf Eisen (Alfred Wegener Institute, Germany)

Simon Alexander (Australian Antarctic Division, Australia)

Description

This session is accepting presentations on recent results from high-latitude field campaigns. These can include any type of campaign (e.g. atmospheric, ice or ocean based). We welcome presentations on IPY and Antarctic InSync proposed projects too.

JMCP17 Natural Hazards

Convener(s)

Matthew Lazzara (University of Wisconsin - Madison, Madison Area Technical College, USA, IAMAS)

Keith Alverson (WCRP-CliC International Project Office & University of Massachusetts, USA, IAMAS)

Co-Convener(s)

Mathieu Morlighem (Dartmouth College, USA)

Malte F. Stuecker (University of Hawaii at Manoa, USA)

Delei Li (Institute of Oceanology, China)

Description

Science research and field studies on natural hazards and their impact in the atmosphere, cryosphere, and ocean are the focus of this session. Presentations are welcome on the wide variety of hazards that affect our environment. Rapid warming has caused changes in the cryosphere at unprecedented rates, with significant impacts on landscapes and ecosystems. The atmosphere is witnessing dramatic heatwaves, extreme weather events, and atmospheric rivers - many of which are proving to be costly both from a human lives and economic standpoints. The ocean is experiencing warming, significant changes in sea ice, as well as sea level rise. Risks include avalanches, landslides,

lake outbursts, volcano-ice interactions, permafrost thaw, and impacts on mountain communities. Storm damage, flooding, record heat, coastal erosion, cold air-outbreaks, blizzards, changing severe weather regions are additional risks rising from today's natural hazards.

Not led by ICPM but will have a polar element:

M04 Cloud-Precipitation-Aerosol Studies

Convener(s)

Greg McFarguhar (Oklahoma University, USA)

Co-Convener(s)

Mary Barth (NCAR, USA)

Floortje Can Den Heuvel (BAS, UK)

Lu Chunsong (NUIST, China)

Hugh Coe (Manchester University, UK)

Description

Papers are solicited on theoretical, observational, laboratory and numerical modelling studies of cloud and precipitation microphysics, aerosols, chemistry and dynamics. The following topics (list non exhaustive) will be covered: Basic cloud and precipitation physics (including cloud condensation nuclei and ice nucleating particles and primary and secondary ice formation processes); ice nucleating particle measurements/monitoring; laboratory cloud simulation experiments; dynamics, microphysics and aerosol/chemistry in different type of clouds (fog, boundary layer, convective, severe storms, mid-level stratus, cirrus,..); cloud electrification; aerosol/cloud/precipitation interaction; cloud chemistry and its effect on atmospheric composition; clouds, aerosols and climate (including radiative properties of clouds); measurement techniques and instrument development; planned and inadvertent weather and climate modification. Papers on all these topics are solicited. As part of the symposium, there will be joint sessions on cloud-aerosol interactions between ICCP and iCACGP and a joint session on polar clouds-aerosol-precipitation between ICCP and ICPM.

M20 High resolution modelling of regional and local climate

Convener(s)

Tomas Halenka (Charles University, Czech)

Co-Convener(s)

Gaby Langendijk (Climate Service Center Germany, Germany)

Peter Hoffmann (GERICS, DEU)

Diana Reichid (Climate Service Center Germany, Germany)

Lee Welhouse (University of Wisconsin-Madison, USA)

Description

Regional climate models can be used not only for dynamical downscaling of the GCMs results but for the analysis of a broad spectrum of problems, e.g. in land surface interaction, cloud processes, atmospheric chemistry and many other purposes. The recent trends emphasize increasing resolution, shifting from a few tens of km towards just a few kilometers where so-called convection-permitting mode can significantly contribute to the reality how some processes are captured. This is especially true for precipitation, as well as for introduction of very local processes, like

urbanization and local atmospheric chemistry. However, it should be said that this approach is very demanding in terms of computational resources. This lead already in the past to the broader cooperation between the groups (CORDEX), which despite of the demands enable to provide strong ensembles of the simulations for regions of interest with full coverage of necessary scenarios for climate projections. Higher resolution simulations from RCMs can significantly improve the applicability of scenarios outputs for climate change impacts assessment and for further climate services and decision made for adaptation on these changes.

Contributions addressing all these above mentioned aspects, i.e. mountains and land-use effects, impacts of urbanization, effects of the regional climate and atmospheric chemistry interactions, specific regions problems like in polar or tropical areas, as well as broader regional climate modelling science development are welcome to be submitted for this session.

JCM01 Coupling between the atmosphere and snow/ice surfaces: Observations and modelling

Convener(s)

Rebecca Mott (WSL, Switzerland)

Co-Convener(s)

Michael Town (ESR, USA)

Vincent Vionnet (ECCC, Canada)

Richard Essery (University of Edinburgh, UK)

Description

This symposium addresses fundamental exchange mechanisms of mass and energy between the cryosphere and the atmospheric boundary layer in snow- and ice-covered regions. The interaction between the near-surface atmosphere and the cryosphere can lead to significant spatial and temporal variations of momentum, mass- and energy exchange as well as complex atmospheric flow patterns that are modulated by complexities in topography and land surfaces. These processes strongly affect the evolution of seasonal snow cover, glaciers, permafrost and sea ice, and drive snow and ice hydrology. We invite contributions on topics including but not limited to:

treatment of turbulent fluxes over snow in models and measurements advection of energy to snow-covers and glaciers and impact on snow and ice melt orographically-induced precipitation and preferential deposition of snowfall wind-induced snow transport and associated sublimation impact of vegetation on snow/atmosphere interactions relative influence of precipitation, latent heat transfer, and redistribution on water isotope signals in snow and ice Studies in level and mountainous terrain are welcome. Those who make observations, run models (coupled, or driven from one side or the other), and develop model parameterizations are encouraged to participate in this session.

JMC13 Tropical-polar interactions under rapid climate change: Processes and influences

Convener(s)

Lin Wang (Institute of Atmospheric Physics, China, IAMAS)

Co-Convener(s)

Xichen Li (Institute of Atmospheric Physics, China)

Minghu Ding (Chinese Academy of Meteorological Science, China)

Description

Present and future interactions of weather/climate variability between tropical and polar regions. Role of atmosphere-ocean-ice-land coupling in the tropical-polar interactions. Dynamics, modelling, and predictability of the tropical-polar interactions.

Influences of the tropical-polar interactions on mid-latitude weather/climate in current and future climate.