



# Climate and Cryosphere Core Project

44th Session of the WCRP Joint Scientific Committee

*Amy Lovecraft, Edward Hanna & Beatriz Balino*  
9 May 2023  
Climate Center, Brussels, Belgium



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**WCRP**  
World Climate Research Programme



# Progress and achievements over the last year

- **SSG 2023**: New co-chair from 2023 (A. Lovecraft) & six new members (4 from the Global South).
- **International Project Office** at the Bjerknes Centre, Norway, closed Dec 2022. It will relocate at its new host U Massachusetts at Amherst, tentative start June.
- **Future of CliC**: Bespoke dialogues with leaders of the 15 current activities to discuss their strategy for the next 5 years. Most CliC activities have achieved their goals and will reorganise, appoint new leadership, set new objectives and identify knowledge gaps.
- **CliC Grants for Early Career Scientists**
  - 1<sup>st</sup> call 2022: 48 applications, 4 awarded. 3 completed, 1 delayed (to start in 2023).
  - 2<sup>nd</sup> call 2023: 59 applications, 4 awarded
- **A CliC grantee** nominated to SSG membership



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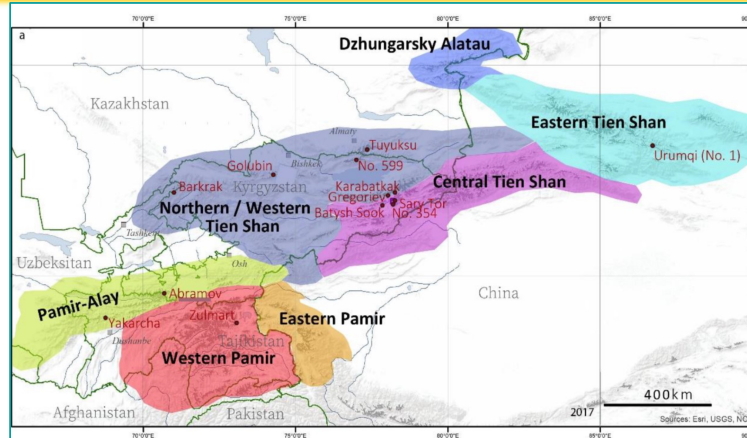




# CLIC Grants 2022

*Meteorological forecasts for the early warning of hazards in the glacierized catchments of Central Asia*

**Dr Gavkhar Mamadjanova**  
Hydrometeorological Research Institute,  
**Uzbekistan**



Credit: <https://doi.org/10.1016/j.wasec.2020.100072>

*Snowpack characteristics in the Karakoram mountains via in-situ measurements and surface modelling*

**Dr Jawairia Ahmad**  
Centre for Water Informatics and Technology, **Pakistan**



*Glacier monitoring and educational activities in the Karakoram, Pakistan*  
**Dr Alexander Groos**

Friedrich-Alexander University Erlangen-Nürnberg, **Germany**



*Glacier related hazards in the Northern Patagonian Andes (to be launched in 2023)*

**PhD candidate Lautaro Clavero**  
Instituto de Nivología, Glaciología y Ciencias Ambientales, **Argentina**

Supervisor: Lucas Ruiz

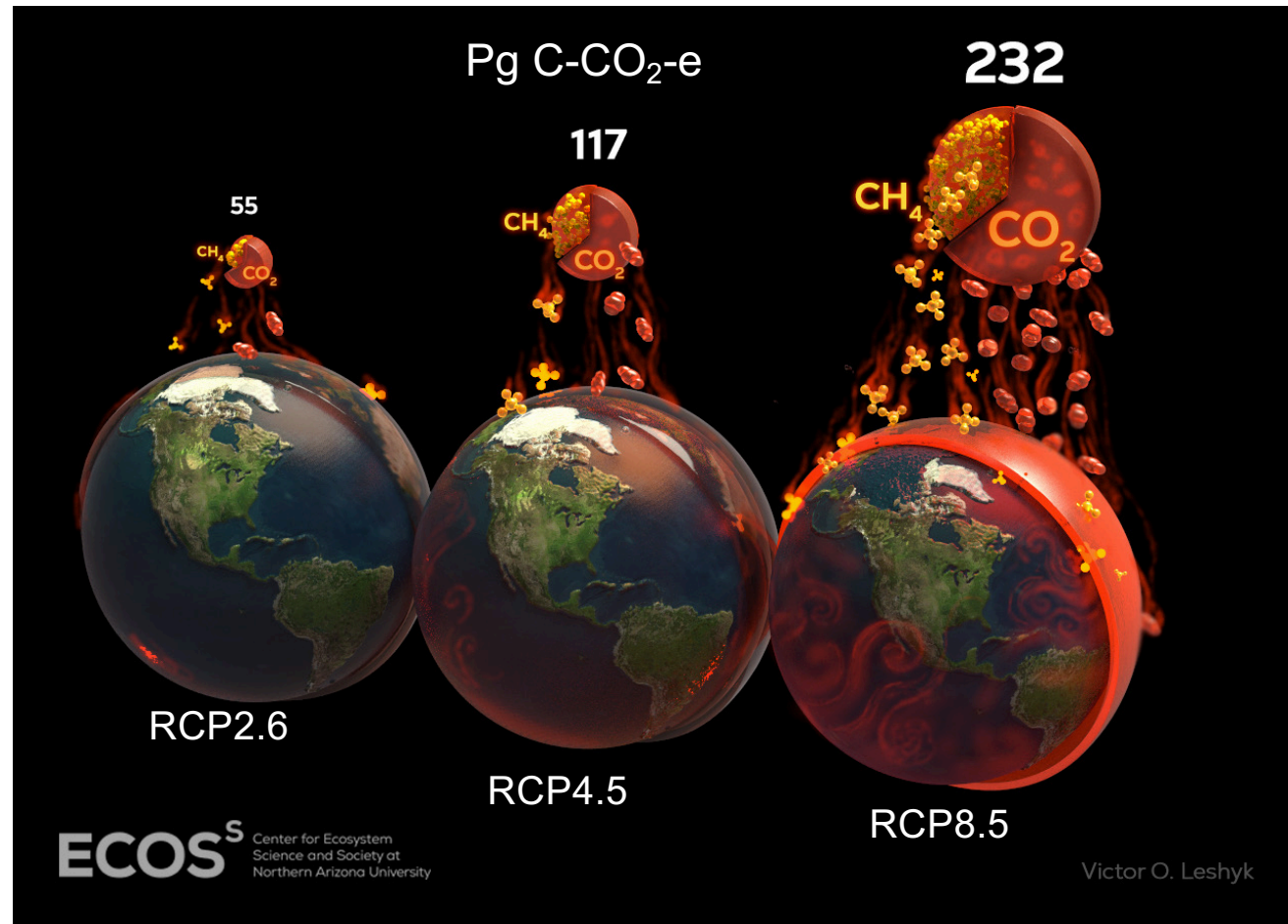


# Science Highlights (1): a decade of permafrost research

Schuur EAG, et al. . <https://doi.org/10.1146/annurev-environ-012220-011847>

## Cumulative projected net GHG emissions 2000-2099 (Petagrams C)

- The CO<sub>2</sub>-equivalent (Co2-e) combine the effect of CO<sub>2</sub> and the higher warming potential of CH<sub>4</sub>
- The idea of an abrupt “methane bomb” release of overwhelming levels (Pg) of CH<sub>4</sub> emissions over one to a few years is not supported by current observations or projections. However, recent appearance of methane craters, a new phenomenon associated with elevated CH<sub>4</sub> concentrations, is a reminder that Arctic carbon cycle surprises are likely to emerge as the Earth warms.
- Future impacts depend both on human actions and the response of Arctic ecosystems.

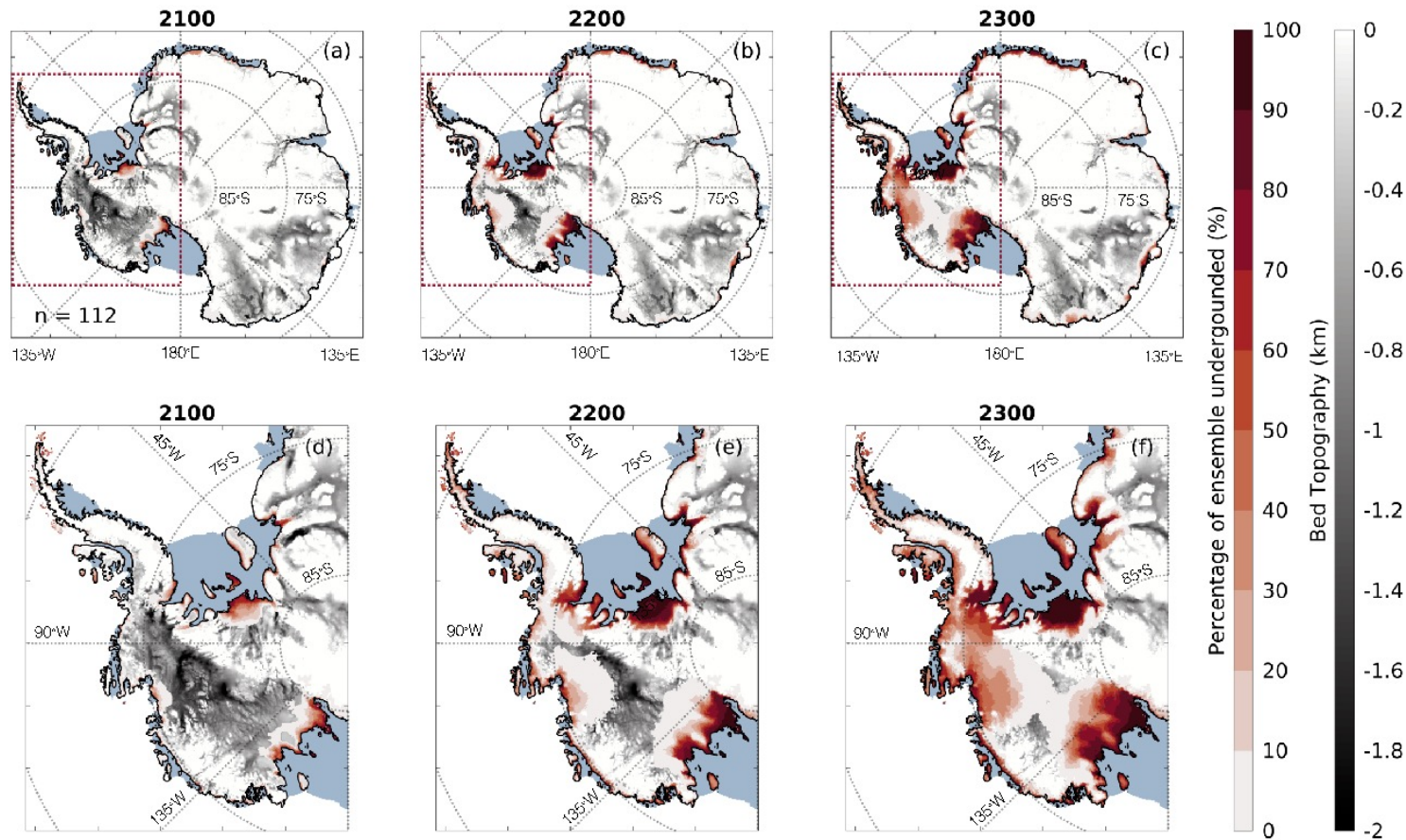




## Science Highlights (2):

# Projections of Antarctic ice sheets development 2100/2200/2300

Grounding line retreat from over 110 ice sheet simulations in response to multiple climate models under high emission scenarios (RCP8.5 and ssp5-85). Participation of 16 modelling groups.





# Future plans

- *Implementation of CliC Strategy Plan 2022-2031*: New activities will be launched.
- *Re-structuring of CliC* to adapt to existing and new activities under the new Strategy Plan
- *3<sup>rd</sup> call CliC-WMO Grants 2024*: build linkages between CliC and WMO Global Cryosphere Watch & the polar regional climate centres and outlook fora.
- *Report Card for Antarctica?* Suggestion for CliC to launch and coordinate such an initiative
- *CLIC Open Science Conference 2025*: Dates and venue TBD.



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# Linkages with Core Projects, Lighthouse Activities etc.

## ON-GOING COLLABORATION

- *CLIVAR*: Joint Southern and Northern Ocean Regions Panels
- *SPARC*: Polar Climate Predictability Initiative
- *GEWEX*: ESM-Snow MIP/Land surface, snow and soil moisture MIP
- *CORDEX*: PolarCORDEX (Regional downscaling Arctic and Antarctica)
- *CMIP*: ISMIP6, SIMIP, MISOMIP, GlacierMIP, ESM-snowMIP/LS3MIP
- *Safe Landing Climates LHA*: Ice Sheet Mass Balance and Sea Level (ISM MASS)



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# Linkages with Core Projects, Lighthouse Activities etc.

## PLANNED COLLABORATION

- *Global Precipitation Experiment (GPEX)*: CliC contributed to Science Plan Team.
- *GEWEX*: ANDEX Regional Hydroclimate Project
- *GEWEX & CLIVAR*: Monsoon Panel in Asia
- *EMSO*: All CliC modelling activities
- *Rifs*: Explore venues of collaboration with their planned 4 clusters

- *Safe Landing Climates*: on Arctic-tropics teleconnections of water resources & on permafrost (methane mitigation)
- *My Climate Risk*: Explore venues of collaboration with the ICIMOD Himalayan Hub
- *Digital Earth*: The cryosphere is missing. Need to resolve storms, oceanic eddies and boundary currents, streamflow in catchments on the land and large glaciers.
- *Academy*: Promote capacity building & training opportunities endorsed by CliC.
- *WWRP*: Participate in the *Polar Project 2024-2028*





# Partnerships & liaison outside of WCRP

CLIC endorsed activity	Partner
Antarctica Sea Ice Processes & Climate (ASPeCt)	SCAR & GCW
Ice-sheet Mass Balance & Sea Level (ISMASS)	SCAR & IASC
Linkages Arctic Climate Change and Mid-Latitude Weather Extremes (LINKAGES)	
Southern Oceans Regional Panel (SORP)	SCAR & CLIVAR
Biogeochemical Processes at Sea Ice Interfaces (BEPSII)	SCAR, IASC & SOLAS
Permafrost Carbon Network (PCN)	IARC & SEARCH

Liaisons
<b>Int Arctic Science Committee (IASC)</b> <ul style="list-style-type: none"> <li>• Atmosphere Working Group</li> <li>• Cryosphere Working Group</li> <li>• 4<sup>th</sup> International conference on Arctic Research Planning (ICARP IV)</li> </ul>
<b>Arctic-Subarctic Ocean Fluxes (ASOF)</b>
<b>Association of Polar Early Career Scientists (APECS)</b>
<b>Executive Council Panel on Polar and High Mountain Observations Research and Services (EC-PHORS) of WMO</b>

GCW: Global Climate Watch (WMO)  
 IASC: International Arctic Science Committee  
 IARC: International Arctic Research Center (NSF)  
 SEARCH: Study of Environmental Arctic Change (ARCUS)  
 SCAR: Scientific Committee on Antarctica Research  
 SOLAS: Surface Ocean Lower Atmosphere Survey (Future Earth)



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# Issues and challenges

1. **CliC slow progress since 2019:** the SSG has yet to meet in person; limited adm support from a chronically understaffed IPO the past 5 years; launching of new activities still pending. In second half of 2023 CliC expected to pick up pace when the SSG meets in person and with the support from a new and full-fledged IPO.
2. **New structure for CliC:** With 15 on-going activities and new ones planned for 2024 it will exert a **pressure on the budget**. This calls for a re-structuring of the project to implement its new strategic areas and setting funding priorities.
3. **Partnerships and liaisons:** **strengthen** cooperation and liaisons with present partners & organisations to avoid duplication of efforts and explore co-funding activities. Identify **new partners & organisations** to collaborate with.
4. **Model data:** The modelling community is concerned with the lack of support for **data archival, availability and accessibility**, and have inquired whether CliC could assist in the design a funding strategy together with partners.