



AntClim²¹



British
Antarctic Survey
NATURAL ENVIRONMENT RESEARCH COUNCIL



Workshop on CMIP6 21st century projections and predictions for Antarctica and the Southern Ocean

June 26-28 2019, British Antarctic Survey, Cambridge.

Agenda

Meeting organisers: Nancy Bertler, Tom Bracegirdle, Alia Khan, Gerhard Krinner, Marilyn Raphael and Amanda Wynne

Workshop webpage:

<https://www.scar.org/scar-news/antclim21-news/update-on-antclim21-workshop-on-21st-century-climate-projections-and-predictions/>

Day 1 (Wednesday 26 June)

10-10.40 arrival and tea/coffee

10.40 Welcome, introductions and workshop overview

11.00 – 13.00 Oral **Observed and simulated Antarctic climate part 1: the modern era**

Chair: Gerhard Krinner

11.00 John Turner - Recent Antarctic climate change

11.20 Marilyn Raphael - Representation of Antarctic climate in CESM2- Sea ice variability and atmosphere interactions

11.40 Alexander Haumann - A major shift in the Southern Ocean climate system and the role of sea ice

12.00 Thomas Rackow - Antarctic sea ice trends in climate models tied to ocean resolution

12.20 Daniel McCoy - Cloud feedbacks and variability in Southern Ocean cyclones: insight from long-term satellite data and high-resolution global simulations

12.40 Matthew Patterson - Southern Hemisphere blocking biases and future changes in CMIP5

13.00 Group photo then lunch

13.40 – 14.00 Tour of BAS ice core labs

14.00 – 15.40 Oral **Wider impacts and policy implications of Antarctic climate change**

Chair: Tom Bracegirdle

14.00 Tom Bracegirdle – SCAR links to policy

14.10 Emily Shuckburgh – How Antarctic climate information can impact policy decisions

14.30 Rachel Cavanagh – Integrating climate research into conservation and management of the Southern Ocean

14.50 Peter Fretwell – The sea ice ecosystem; emperors, ice seals and the need for better predictive models

15.10 James O’Neill – The Antarctic ice sheet and sea-level rise: supporting decision makers

15.30 Graham Simpkins - An Introduction to Nature Reviews Earth & Environment

15.40 Tea & Coffee

16.00 – 17.00 **Breakout 1** CMIP6 data access and availability. Possible discussion points include:

Current status and availability;

Available diagnostic tools;

Discussion of priority variables to request from data centres.

Chair: Joellen Russell

19.00 - Workshop dinner at The Royal Cambridge

Day 2 (Thursday 27 June)

9.00 – 10.40 Oral **Observed and simulated Antarctic climate part 2: the longer-term perspective**

Chair: Nancy Bertler

- 9.00 Ilana Wainer - Changes in the Atlantic Sector of the Southern Ocean estimated from the CESM Last Millennium Ensemble
- 9.20 Johan Etourneau - How can we better constrain the ocean versus atmosphere impact on modern, past and future Antarctic ice shelf instability? An example off the eastern Antarctic Peninsula
- 9.40 Xylar Asay-Davis - The influence of Antarctic ice-shelf melt fluxes on pre-industrial climate conditions in the Energy Exascale Earth System Model (E3SM)
- 10.00 Nancy Bertler - Past examples of ice sheet retreat – insights into ice sheet sensitivity and rate of change
- 10.20 Liz Thomas - How can ice cores support future climate predictions?

10.40 Tea & Coffee

11.00 – 13.00 Oral **How will the Antarctic environment change over the 21st century**

Chair: Marilyn Raphael

- 11.00 Laura Landrum - Current and future Antarctic sea ice variability and change in the CESM2
- 11.20 Gerhard Krinner - Empirical Run-Time Bias Correction for Antarctic Regional Climate Projections With a Stretched-Grid AGCM
- 11.40 Kaitlin Naughten - Future Projections of Antarctic Ice Shelf Melting Based on CMIP5 Scenarios
- 12.00 Cecile Agosta - Selecting global climate models for forcing ice sheet models
- 12.20 Sophie Nowicki - The Ice Sheet Model Intercomparison Project for CMIP6 (ISMIP6): overview, accomplishments and challenges (**Remote from Maryland USA**)
- 12.40 Tamsin Edwards - Quantifying model uncertainties for ISMIP6

13.00 Lunch

14.00 Poster introductions (2 mins and max 2 slides)

Chair: Marisol Osman

- Lucas Almeida - Ekman Pumping spatial and temporal variability in the Southern Ocean using CMIP models
- Alice Barthel - Towards quantifying multi-model uncertainty in Antarctic basal melt rate using high-resolution regional ocean modelling
- Heitor Evangelista - Detection of a persistent Solar forcing imprint during Mid-to-Late Holocene at Northern Antarctic Peninsula climate
- Tessa Gorte - Antarctic surface mass balance trends over the 20th century in reconstructed reanalyses and CMIP5 climate models.
- Maria Vittoria Guarino - The Past and Future of Antarctic Sea Ice: The Last Interglacial
- Matthew Harris - Patriot Hills Blue Ice Area Holocene isotope record offers important Antarctic climate variability data for the Weddell Sea sector
- Dan Jones - Unsupervised classification as a tool for discovering dynamical and biogeochemical geographies
- Alia Khan – Antarctic Climate Change over the 21st Century: a summary of AntClim21
- Erik Mackie - Southern Ocean Circulation and Frontal Dynamics from Cryosat-2 Along-track Radar Altimetry

Andrew Orr - Broad agreement of Antarctic Surface Mass Balance patterns but locally very large differences between regional climate model estimates

Marisol Osman - Revision of the contributions of external forcings to the Southern Annular Mode trend

Lettie Roach - The influence of nonlinear physical processes on the seasonal cycle of Antarctic sea ice

Natália Silva - Variability in the Antarctic Wind Field During the 20th Century

Holly Winton - Ice core biomarker constraints on past Antarctic sea ice change

14.30 Poster session

15.30 Tea & coffee

16.00 – 17.00 **Breakout 2.** Comparing models and observations. Suggested topics include:

Model-observation comparisons and future projections;

Connecting climate/ES model simulations and the wide range of available in-situ observational and proxy datasets;

Best practices for designing a field campaign to produce data of maximum use in the evaluation of gridded numerical models.

Chair: Alia Khan

18.00-19.00 – Punting on the River Cam

Day 3 (Friday 28 June)

9.00 – 10.20 Oral **How will the Antarctic environment change over the 21st century**

Chair: Alia Khan

09.00 Siobhan O'Farrel - Response in the Antarctic in CMIP6 runs in the ACCESS CM2 and ACCESS 1.5 ESM simulations (**Remote from Australia**)

09.20 Tom Bracegirdle – 21st century projections of surface winds at high southern latitudes

09.40 Andrew Meijers - CMIP5 and CMIP6 Southern Ocean heat uptake in the ORCHESTRA project

10.00 Joellen Russell - Impact of Winds and Melt Water on Future Southern Ocean Heat and Carbon Uptake: CMIP6

10.20 Marcos Tonelli - Warm Deep Water changes in the CMIP5/CMIP6 climate projections

10.40 – Tea & Coffee

11.10 – 12.30 **Breakout 3** Discussion on possible important missing processes in CMIP6 models. Suggested topics include:

Freshwater fluxes / interactive ice sheets;

The representation and evaluation of aerosols over the Southern Ocean;

an early view on, dare I say it, CMIP7!

Chair: Organising committee

12.30 Lunch

13.30 – 15.00 **Breakout 4** Priorities for AR6 papers – plans and possible collaborations.

Chair: Organising committee

15:00 – Meeting close

List of registered participants

1. Cecile Agosta
2. Clare Allen
3. Lucas Almeida

4. Xylar Asay-Davis
5. Robert Arthern
6. Alice Barthel
7. Nancy Bertler
8. Tom Bracegirdle
9. Rachel Cavanagh
10. Tamsin Edwards
11. Johan Etourneau
12. Heitor Evangelista
13. Peter Fretwell
14. Tessa Gorte
15. Maria Vittoria Guarino
16. Matthew Harris
17. Alexander Haumann
18. Karen Heywood (remote)
19. Scott Hosking
20. Dan Jones
21. Julie Jones
22. Alia Khan
23. Gerhard Krinner
24. Laura Landrum
25. Erik Mackie
26. Daniel McCoy
27. Andrew Meijers
28. Michael Meredith
29. Sophie Nowicki (remote)
30. Siobhan O'Farrell (remote)
31. James O'Neill
32. Andrew Orr
33. Marisol Osman
34. Matthew Patterson
35. Thomas Rackow
36. Marilyn Raphael
37. Kaitlin Naughten
38. Lettie Roach
39. Joellen Russell
40. Emily Shuckburgh
41. Natália Silva
42. Louise Sime
43. Graham Simpkins
44. Liz Thomas
45. John Turner
46. Marcos Tonelli
47. Ilana Wainer
48. Holly Winton

Remote viewing invites

1. Nerilie Abram
2. Francis Codron
3. Dirk Notz

4. Helene Hewitt
5. Kevin Hodges
6. Caroline Holmes
7. Ron Maor
8. Irina Marinov
9. David Reusch
10. Robin Smith