



Climate Science2Policy Workshop

17 November 2020

Session "Ocean and Polar Processes"



Agenda for this session

Polar climate change and remote impacts

- Thomas Jung (APPLICATE)

Permafrost thaw, a feedback to the physical, social and cultural earth

- Hugues Lantuit (Nunataryuk)

Southern Ocean and Polar amplification

- Jean-Baptiste Sallée (SO-CHIC)

AMOC and its regional components

- Steffen M. Olsen (Blue-Action)

Q&A- moderated by Hannah Grist (Blue-Action)

Presentation of recommendations - Steffen M. Olsen & Thomas Jung

Discussion- moderated by Dragana Bojovic (APPLICATE)

Policy recommendations

1. Long-term, **sustained observations** of the Southern Ocean, North Atlantic and Arctic Ocean are required to inform climate predictions and develop a Digital Twin of the Ocean and Earth System.
2. Adapting to a risk-based approach that allows **planning for gradual and extreme changes** is needed to bridge the science-to-policy gap that exists in Polar and ocean research.
3. Information on regional and local scales are needed to support **climate change adaptation**, but the results from global climate models are (highly) uncertain for polar regions and need to be improved to better represent all key processes.
4. Climate change adaptation requires knowledge **co-production and transdisciplinary efforts** to bridge the gap between global/regional model outputs and local policy recommendations.
5. Polar and ocean changes have the potential to impact socio-ecological systems remotely through teleconnections; a **better understanding of these linkages** is needed to build a climate-resilient society.
6. The **ocean is a climate regulator**, and future international agreements need to account for the predicted changes to the oceans.
7. Collaboration is crucial to ensure a **joint global response** to climate challenges by exploiting synergies, increasing critical mass and bringing different communities together.

Research gaps

1. Risks of AMOC collapse and associated impacts must be evaluated in a suite of models, using direct and indirect observations.
2. Further work is needed to understand the independent dynamics of the subpolar gyre and its connection to the Arctic.
3. Improvements in the ability of climate models to represent processes related to Atlantification and Pacification are required to reduce uncertainty in future projections.
4. A greater understanding of the Southern Ocean must be developed, including monitoring ocean carbon and heat fluxes and storage, and the underpinning large-scale circulation.
5. Understanding of ocean, atmosphere, and cryosphere feedback in the subpolar Southern Ocean must be improved by sustained subpolar ocean observations.
6. Substantial biases in climate models in the Polar regions must be urgently reduced through increasing resolution, incorporating important Earth system feedbacks and by confronting models with observations.
7. The gulf between observational and modelled studies on the influence of Arctic sea ice loss on mid-latitude atmospheric circulation must be reduced.
8. A greater quantitative understanding of the impact of warming permafrost on the land-to-sea continuum is needed.
9. Climate change must be made more tangible by developing plausible storylines to illustrate future warming scenarios.

APPLICATE.eu
Advanced prediction in
polar regions and beyond

<https://applicate.eu>

BLUE ACTION

<http://blue-action.eu>

SO-CHIC
Southern Ocean Carbon and
Heat Impact on Climate

<http://www.sochic-h2020.eu>

NUNATARYUK
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<https://nunataryuk.org>



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