

Tipping points, extreme events and uncertainty: How can studying the Arctic help us predict future European climate beyond the mean?

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Online event



Hosted by MEPs Urmas Paet and Christel Schaldemose

Co-chairs of the Arctic Working Group of
the EP Intergroup on “Climate Change, Biodiversity and Sustainable Development”

Speakers:

- **MEP Urmas Paet**
- **Sigi Gruber**, Head of Marine Resources Unit, DG-Research and Innovation, European Commission (DG RTD)
- **Lars H. Smedsrud**, Professor, Geophysical Institute, University of Bergen, Bjerknes Centre for Climate Research, Professor II at UNIS, Longyearbyen, Svalbard, Arctic Fulbright Chair 2019-2020
- **Steffen M. Olsen**, Blue-Action Coordinator, Danish Meteorological Institute
- **Didier Swingedouw**, University of Bordeaux
- **Helene R. Langehaug**, Researcher at NERSC and Member of Bjerknes Climate Prediction Unit
- **Joan Ballester**, ISGlobal
- **Nuno Lopes**, Head of the Innovation, Climate and Energy Division, City Council of Almada
- **Minninnguaq Kleist**, Head of Greenland Representation / Minister Counsellor, Greenland Representation to the EU
- **Femke de Jong**, Physical Oceanographer, NIOZ
- **Jennifer Mecking**, Ocean/Climate Scientist, NOC
- **Svein Østerhu**, Physical Oceanographer, NORCE
- **MEP Christel Schaldemose**

Welcome Remarks

MEP Urmas Paet

“The climate change effects, the growing competition for access to the Arctic natural resources and the increasing economic activities could bring opportunities, but also, of course, risks to the region.”

Mr. Paet started his intervention by explaining that the Arctic region, which has been for a long time an area of international cooperation, was experiencing many environmental changes that could affect this equilibrium. Then, Mr. Paet introduced the exceptional story of EU Arctic policy and **highlighted the EU investments on a broad range of issues such as tourism or transports**. However, due to the rapid strategic evolution in the Arctic, **Mr. Paet underlined the need for the EU to update its EU Arctic Policy**. Accordingly, Mr. Paet **welcomed the recent launch of the EU public consultation on the way forward for the European Union's Arctic policy and the future production of an EP policy report on this issue**. Mr. Paet continued his speech by focusing on the international evolution in the Arctic, stressing the **growing role of China in the region**. Moreover, Mr. Paet **displayed the risks, but also the economic and strategic opportunities, that fossil resources (such as natural gas) still represent in the Arctic**. The necessity to include indigenous people in policy-making processes was also stressed by Mr. Paet. To conclude, Mr. Paet focused on the need for the large greenhouse gas emitters, such as the EU, to reach the targets of the Paris Agreement in order to protect the Arctic from irreversible environmental changes.

Panel Discussion

Sigi Gruber, Head of Marine Resources Unit, DG-Research and Innovation, European Commission (DG RTD)

“As the path of climate change is accelerating, also the actions needed by policymakers have to accelerate.”

First of all, Ms. Gruber stated that **it is not possible to ignore scientific evidence regarding climate change's impacts in the Arctic and that the economic and environmental costs of inaction are increasing**. However, Ms. Gruber explained that the **Arctic is also a laboratory to understand the interconnected dynamics of global warming and the development of extreme meteorological events**. Moreover, Ms. Gruber stressed the need for decision makers to concretely act on climate change and highlighted the importance of the EU Green Deal strategies. Accordingly, **Ms. Gruber pointed out the crucial role of research and innovation in this process, but also the necessity to have a just and inclusive transition**. Additionally, Ms. Gruber presented the **new Horizon Europe framework** which notably includes instruments related to the missions on “healthy oceans, seas and coastal waters” and on the “adaptation to climate change”. **The cumulative detrimental effects of climate change on the oceans and on the Arctic** were then displayed by Ms. Gruber, stressing that **those will be tackled in the future missions of the EU**

research policy. Finally, Ms. Gruber notably highlighted the success of the Blue-Action project, reasserting how it is important to support scientific research, and investing in science-based innovation in order to provide knowledge and solutions to global warming consequences.

Lars H. Smedsrud, Professor, Geophysical Institute, University of Bergen, Bjerknes Centre for Climate Research, Professor II at UNIS, Longyearbyen, Svalbard, Arctic Fulbright Chair 2019-2020

“If we look ahead and we ask, “can we still save the Arctic sea ice?”, the answer used to be a clear “yes”. The new set of experiments that have been run for the upcoming IPCC report actually are more doubtful.”

Mr. Smedsrud first started by **presenting the European Climate Research Alliance which has the mission to advance Arctic climate research in Europe through international cooperation, identification of key topics and advice sharing.** Secondly, Mr. Smedsrud explained that **we are losing Arctic sea ice at a very impressive rate** and illustrated this statement by disclosing that, every 0,8 seconds, the equivalent of 1 soccer field of Arctic sea ice is disappearing. Accordingly, the figures show that in September 1980, there was about 7,5 mill km² of sea ice, while in September 2020 we had about 3,9 mill km². Then, Mr. Smedsrud underlined the **causal link between the emission of anthropogenic CO² and the loss of Arctic sea ice.** After stressing that the EU has become a global actor in climate action, Mr. Smedsrud presented some possible scenarios regarding Arctic sea ice loss, identifying also several research gaps that need to be tackled in the near future.

Steffen M. Olsen, Blue-Action Coordinator, Danish Meteorological Institute

“Climate change will continue to create significant stress in Europe in spite of the mitigation efforts, we need to strengthen the efforts on climate-proofing, resilience building, prevention and preparedness through improved climate predictions and projections and climate services”

First of all, Mr. Olsen explained that in response to rapid evolution in the region due to climate change, **EU’s ambition in the Arctic was to build a low-tension zone and peaceful cooperation.** Additionally, Mr. Olsen displayed the main goals of the EU Arctic policy. Then, Mr. Olsen underlined that **the effects of climate change in the Arctic will have global consequences such as sea level rises or changes in weather patterns.** To counter this, **Mr. Olsen recommended to strengthen the efforts on climate-proofing, resilience building, prevention and preparedness.** Then, Mr. Olsen displayed different timescale and geographical scales of climate analysis, and their respective relevance for the society and policymaking. Nevertheless, Mr. Olsen also underlined the complexity of climate predictions which are interconnected in three blocks: computer models where Blue-Action focuses and the advanced techniques to create a data

assimilation system, where the Copernicus programme focuses. Finally, Mr. Olsen reasserted the main missions of the Blue-Action project.

Didier Swingedouw, University of Bordeaux

“There is a possibility of abrupt climate changes in the North-Atlantic / Arctic (based on the IPCC-type climate models), which could have global impacts.”

During his presentation, Mr. **Swingedouw addressed the risks and impacts of abrupt climate changes in the North Atlantic**. More specifically, Mr. Swingedouw explained that researchers are observing a decrease in salinity and a cooling of the subpolar gyre (SPG) which **could potentially indicate an ongoing weakening of the Atlantic Ocean Circulation**. According to Mr. Swingedouw, this **might create tipping points and rising instability in the Atlantic Ocean which could for instance link to abrupt temperature changes in Europe**. Moreover, Mr. Swingedouw displayed **the major global consequences of a change in Atlantic circulation** (decrease in food production, increase number of extreme weather events, etc). Then Mr. Swingedouw explained that when approaching a tipping point, climate variability tends to increase. This early warning of abrupt change can also be accompanied by other signals such as the stratification of the water column or changes in currents flows. According to Mr. Swingedouw, when compiled, those **measurement help to predict the risk for abrupt climate shifts in the coming decades**. To conclude, **Mr. Swingedouw highlighted the need to start thinking about adaptation plans to be prepared to potential associated crises** (e.g. COVID).

Helene R. Langehaug, Researcher at NERSC, and Member of Bjerknes Climate Prediction Unit

“Great potential to improve predictive capacity of climate models in the atmosphere and Arctic region.”

Ms. Langehaug’s general intervention was based on the **key role of the ocean for climate prediction in the North Atlantic / Arctic Region**. To begin with, Ms. Langehaug explained the **challenges to predict climate changes in the Arctic region several years ahead**. However, Ms. Langehaug underlined that **the observation of variables in the warm and saline water from the south gives rise to a certain extent of predictability**. Nevertheless, the possibility to predict climate changes in the North Atlantic Ocean several years ahead is easier due to the predictability coming from changes in the large-scale ocean circulation. Additionally, Ms. Langehaug highlighted that also **climate prediction of the atmospheric circulation is possible**, arguing that there is a **real potential to improve the predictability of North Atlantic climate models in the future**. The influence of the Arctic region on the Northern Hemisphere and European’s

climate, which are referred as tele-connections, was also addressed. Finally, Ms. Langehaug explained that **better predictions in the high latitudes could improve predictions on Europe's climate.**

Joan Ballester, Barcelona Institute for Global Health

"One single climate forecasting scheme could lead to multiple early warning systems for different health outcomes, countries, social groups etc."

During his intervention, Mr. Joan Ballester analyzed the **interplay between the predictability of weather and health early warning systems**. More specifically, the predictability of **mortality rates, hospital admissions, occupational accidents** in jobs exposed to environmental conditions, **child health and pregnancy outcomes** are directly **linked to** weather-, seasonal and sub-seasonal-**forecasts** (e.g. heat waves and cold spells). Moreover, there is **different vulnerability to temperature fluctuations among countries, regions and social groups** (e.g. young and elderly, poor and rich etc.). Thus, **one single climate forecasting scheme could lead to multiple early warning systems** for different health outcomes, countries, social groups etc. Mr. Ballester concluded his intervention by underlining that health **early warning systems need to include environmental and socioeconomic data and can reduce inequalities in the adaptation to climate change.**

Nuno Lopes, Head of the Innovation, Climate and Energy Division, City Council of Almada

"Cities are in the frontline of addressing climate challenges and to that end ecosystem-based planning is an effective and flexible way to improve climate resilience."

Mr. Lopes presented an overview of climate action in Almada, Portugal, related to heat waves, highlighting the importance of projects like Blue-Action and the application of science- and nature-based solutions on a city level. More specifically, Mr. Lopes highlighted that the Blue-Action project on modelling temperature-related mortality risk, enabled the **definition of measures for land use planning** and the **improvement of the adaptive capacity and resilience** of Almada. Furthermore, Mr. Lopes mentioned that through the Blue-Action project, Almada is focusing inter alia on applying **flexible and low-cost nature-based solutions**, including heat-health prevention in the Municipal Emergency Plan and **raising awareness** about heat waves in schools. In that line, Mr. Lopes presented several **microclimatic regulation measures**, e.g. boosting urban green corridors, using green roofs and green facades and creating green spaces that combine different ecosystem services with multiple benefits (e.g. flood control and food security). One of Mr. Lopes' key messages was that **cities are in the frontline of addressing climate challenges** and, to that end, **ecosystem-based planning is an effective and flexible way to improve climate resilience**. Mr. Lopes concluded his intervention by highlighting that nature-based solutions are investments well-aligned with the EU Green Deal and the Biodiversity Strategy objectives, and thus **cities should be a target for new financial instruments.**

Mininnguaq Kleist, Head of Greenland Representation / Minister Counsellor, Greenland Representation to the EU

“What happens in the Arctic was caused by something outside the Arctic in the first place and therefore we all share a common but differentiated responsibility.”

Mr. Mininnguaq Kleist started his intervention by highlighting that a **balance is needed between the seemingly contradicting protection of the environment and economic development** in Greenland. Moreover, Mr. Kleist underlined that Greenland utilizes its position in international forums, such as the Arctic Council and the Nordic Council of Ministers, to **promote research** on environmental issues. More specifically, Greenland is currently actively participating in the **production of an e-map assessment** on extreme events, potential tipping points in arctic weather systems and possible impacts on local communities, which is expected to be delivered within the first half of 2021. **One of the components of this assessment is the interaction between Arctic and global weather systems.** Moreover, Mr. Kleist informed the audience that the governments of Greenland and Denmark are establishing an **international Arctic hub to facilitate scientific R&I (research and innovation) and dissemination of knowledge to the public.** Mr. Kleist concluded his intervention by highlighting that while the concept of *“what happens in the Arctic does not stay in the Arctic”* has already been emphasized, it is also important to remember that *“what happens in the Arctic was caused by something outside the Arctic in the first place”*, thus highlighting the principle of the **common but differentiated responsibility.**

Interactive discussion with speakers and science panellists, moderated by Hannah Grist, Knowledge Exchange and Communications Manager for Blue-Action

During the discussion with the audience, Ms. Gruber highlighted the importance of adopting a **holistic approach**, that takes into account climate change, ocean health, human health and security issues, while also stressing that the **COVID-19 pandemic should not hinder the realization of the EU Green Deal objectives.** In that line Ms. Femke de Jong pointed out that unfortunately the **pandemic has caused disruptions in scientific research**, e.g. cruises for data recovery have been cancelled or postponed. Moreover, in light of the recent UN Office Disaster Risk Reduction Report, which highlights the importance of early warning systems and recommends focusing investment on turning early warning into early action, Mr. Kleist commented on the sufficiency of cooperation among stakeholders in providing climate information and fostering improvements. More specifically, Mr. Kleist underlined the importance of **scientists sharing information on their research and research results with both local populations and other scientists**, in order to facilitate scientific cooperation and analysis.

Furthermore, Mr. Østerhus commented on the **state of prediction capacity for Antarctica** and the **impact of changes in the region**, by mentioning the area of research of the Horizon2020 funded project **TiPACCs** (Tipping Points in Antarctic Climate Components). More specifically ice shelves in Antarctica, which keep the in-land ice in place, are protected by cold dense water surrounding them. However, modelling research indicates that in the future those ice shelves will be affected by warm ocean water, which will lead to in-land ice melting into the ocean and significantly increasing sea levels.

Closing remarks

MEP Christel Schaldemose

“We need to keep on funding prediction systems.”

Within her concluding remarks, Ms. Schaldemose stressed the importance of **funding prediction systems**, in order to prepare for extreme events, better understand the drivers of climate change and hopefully address those drivers. Ms. Schaldemose also highlighted the need to **improve data sharing** and mentioned that the European Parliament and the European Commission are currently working on a **European Data Strategy with regards to the above**. Last but not least, Ms. Schaldemose underlined the importance of the **science-policy nexus** and the need to act fast, while also mentioning the key role of the **EU Climate Law** to the discussion.