

# Action on Climate Tipping Points

*Universal climate change is already happening. The University of the Arctic is uniquely positioned to find solutions to prevent, mitigate, adapt to and reverse the changes, and address the consequences to people and environment in the Arctic.*

Global warming will trigger irreversible changes to the oceans, the sea ice coverage, the Greenland and Antarctic icecaps, the tundra, taiga, and permafrost. We are rapidly approaching tipping points that will completely change the Arctic and severely impact livelihoods and nature globally.

The melting of icecaps will lead to a global sea level rise that we are not prepared for. If we cross the tipping points, it will permanently affect and alter life, not just in the Arctic but worldwide for millions if not billions of people. In other words, the future of the Arctic is directly linked to the wellbeing of the whole planet.

Potentially cascading, irreversible events are already taking place. Fortunately, we still have time to address these issues, but only if we, the global community, act now. We need to prevent, mitigate, adapt to and reverse the rapidly changing climate. All action in this direction will get us closer to solutions and contribute to a more sustainable future for all of us.

Communities and peoples in the Arctic are already feeling the effects of climate change. People are displaced from their homes in Alaska and Siberia, and traditional livelihoods are endangered all across the region. People, communities and institutions in the Arctic are the best experts on this region. They have knowledge of what is happening and the potential to find solutions to change course. There are actions that can be implemented in the North and the Arctic to slow or even stop the processes, reduce the risks of climate change, and adapt to the changes that cannot be reversed. However, we also need more research to identify and assess the risks associated with the tipping points so that we are prepared and can take appropriate action.

## **What we can offer**

University of the Arctic (UARctic) is the world's largest network focusing exclusively on education, research and academic collaboration in and about the Arctic, and on challenges evolving due to climate change that impact this extreme environment. We work across borders, across disciplines and across cultures through our 170+ member institutions – leading universities, colleges, research institutes, and Indigenous peoples' organizations – based in the Arctic and beyond. Our members are part of the life, the people and the communities who face climate change. Combining their strengths, we bring together relevant expertise, interdisciplinary approaches, and traditional knowledge systems to address problems and bring innovation that no researcher, institution or country could accomplish on their own. We turn ideas into actions to address major challenges facing the Arctic and the world.

## **What you can do**

International research projects to develop solutions need considerable financial support to bring together the best people from several countries and disciplines to work on one common challenge – more funding than any single agency can offer today. You can be part of the UARctic funding family by learning more about these essential projects aimed at stopping climate change and avoiding irreversible tipping points. Both larger and smaller contributions are fundamental in building the pathway to good solutions. You can also offer support by taking part in the work, developing tangible solutions, or contributing to changing the policies and priorities of businesses and nations.

## FACT SHEET

**A global overview from October 2022 identifies 16 major global climate tipping points<sup>1</sup>, most of which are related to frozen ground, snow, ice, and cold ocean. They include:**

1. Collapse of the Greenland ice sheet
2. Collapse of North Atlantic deep-water formation
3. Collapse of the Arctic winter sea ice
4. Abrupt thaw followed by collapse of the boreal permafrost
5. Northern expansion of the boreal forests

**The global consequences of these tipping points will be severe:**

1. Amplified global warming
2. Rapidly increasing sea level
3. Changes in weather patterns and weather extremes
4. Changes in ocean currents
5. Ocean acidification, de-oxygenation
6. Impacts on ecosystems (fisheries, wildlife, plants)
7. Impacts on food production
8. Impacts on fresh water supply

### **Actions needed**

The ultimate solution to avoid climate-induced tipping points is to avoid further global warming. Even with optimal global actions to hinder climate change, Earth will face some of the tipping points. To find solutions that will postpone or reduce the impact of the tipping points is a rapidly emerging challenge, and we need to identify and develop solutions now.

Public research funding and international instruments created to address climate change are not designed to cover the early development of ideas that could fundamentally help us find solutions to prevent, mitigate, adapt to and reverse global warming. Most ideas published so far are immature and need further development and assessment of the impacts and efficiency. UARctic believes it is important to identify the ideas with the best potential and least impact on environment and populations. We hope to be able to identify, review and materialize concepts which can help the world prevent, mitigate, adapt to and reverse these changes.

**UARctic's priority is to identify, further develop, test and evaluate the effectiveness and impact of solutions that stop or reduce the effect of tipping points.**

**Examples include:**

1. Identify solutions that reduce the speed of permafrost thaw
2. Reduce sea level rise by stopping "warm" ocean from melting glacier from below
3. Secure non-fossil energy supply to off-grid societies, and Arctic coastal fisheries with a safe distribution net of hydrogen
4. Use CO2 emissions from industry; e.g. growing algae from the CO2 which then becomes a basis of healthy fish feed and food production

<sup>1</sup> <https://doi.org/10.1126/science.abn7950>