



A 5°C Arctic in a 2°C World

CHALLENGES AND RECOMMENDATIONS FOR IMMEDIATE ACTION

Briefing Paper for Arctic Science Ministerial

September 28, 2016

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An international group of experts recently gathered at Columbia University to review the latest science on the changing Arctic in the context of the agreement signed at the Paris climate conference (COP21) in December 2015. The workshop, held July 20 – July 21 was organized by The Columbia Climate Center, in partnership with World Wildlife Fund, the Woods Hole Research Center, and Arctic 21. The International Arctic Research Center (University of Alaska Fairbanks), the Arctic Institute of North America (Canada), the MEOPAR Network (Marine Environmental Observation, Prediction, and Response), and the Future Ocean Excellence Cluster, University of Kiel co-sponsored the event. A white paper resulting from the workshop can be found at <http://climate.columbia.edu/news/>. An overview is provided below.

Experts participating in the workshop considered the effects on the Arctic of the Paris Climate Agreement and possible actions needed to limit climate change to between 1.5 and less than 2 degrees C. For the Arctic, such an increase could mean a change of roughly 4 and even up to 5 degrees C.

In light of the many critical regional and global services the Arctic provides to society, and their projected disruption at these levels of temperature change, the assembled experts agreed that implementation of the Paris Climate Agreement must be accelerated. They also considered the possibility that emissions reductions may need to be accompanied by additional actions to sustain critical Arctic systems and to prevent their degradation from continued warming and other environmental changes.

Key Findings of the Workshop

1. Arctic change is a reality. The Arctic is already changing faster than the rest of the globe.
2. Changes are already felt on many fronts and affect not only Arctic residents but also billions of people living outside the Arctic.
3. Through global emissions of carbon dioxide and other greenhouse gases, society has committed the Arctic to substantial future warming with concomitant dislocations.
4. Under all emissions scenarios, warming and substantial ice loss are projected for the next 20 to 30 years, along with other major physical, biological and societal changes.
5. If mitigating actions are not implemented immediately, the Arctic will continue to change dramatically from being white, ice-covered, and stable to a new state of instability with difficult-to-predict interactions, abrupt changes, and global responses.

Unifying the voices of the Arctic nations and global actors will be critical to upscale these efforts and ensure momentum to meet these ambitious goals. An Arctic coalition promoting measures that keep the Arctic's vital functions and services intact, with a voice in the global arena, is essential.

Key Recommendations

1. Understanding the local and global implications of alternative Arctic futures must become a major focus for research efforts.
2. To avert dangerous environmental impacts beyond the time frame of a few decades, it is critical to immediately scale up implementation of alternative energy production, and accelerate decarbonization of the global energy system.
3. Efforts in research and development, and subsequent deployment of carbon dioxide removal on a global scale, must be greatly increased.
4. Arctic communities need support for strategic adaptation – including relocation – now. Arctic people are being forced to adapt in the absence of necessary policy and infrastructural frameworks.
5. Enhancement of the emerging pan-Arctic observing system and addition of early warning components, along with development of Arctic system models, are required to keep “fingers on the pulse” of Arctic change. Increased science investment is needed to identify and track tipping points for the critical components of the Arctic system (such as sea ice, permafrost, and ice sheets) and the global services they provide, such as reflectivity of solar radiation, storage of carbon in permafrost, and storage of glacial ice that prevents sea level rise.
6. Broad stakeholder dialogue is required to inform decision-making on desired outcomes and to shape far-sighted responses to evolving conditions.



Inuit elders teach kayak building and paddling. Baffin Island, Canada

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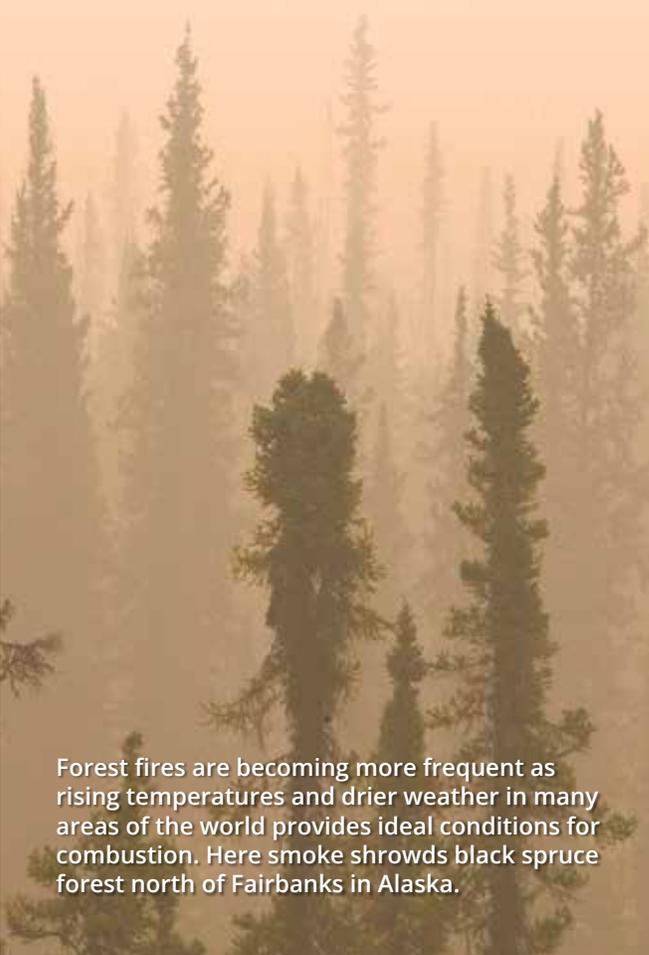
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Forest fires are becoming more frequent as rising temperatures and drier weather in many areas of the world provides ideal conditions for combustion. Here smoke shrouds black spruce forest north of Fairbanks in Alaska.