

WHOI Arctic experts join international climate conference overseas

RESEARCHERS WARN OF LOOMING WORLD
CRISES FROM RAPIDLY WARMING ARCTIC



Arctic researchers from Woods Hole Oceanographic Institution (WHOI) and Woodwell Climate Research Center will present a sobering assessment of a rapidly changing Arctic, including warming oceans, melting sea ice, disappearing glaciers, and thawing permafrost, at the upcoming international climate negotiations in Glasgow, Scotland, known as the Conference of Parties, or COP26 (October 31 – November 12).

The conference brings together world leaders and climate experts, with a mission to update promises made six years ago at COP21 in Paris. Under the Paris Agreement, countries pledged to collectively cut their greenhouse gas emissions enough to keep the planet from heating up more than 1.5-2 degrees C /2.7 degrees Fahrenheit, compared with pre-industrial times. Progress toward those goals has

been insufficient; the planet already has warmed by about one degree Celsius, and the Arctic is warming more than three times faster than the rest of the planet. In order to keep warming below 1.5 degrees C, quick, dramatic cuts in global greenhouse gas emissions are critical.

The Arctic plays multiple important roles in the global climate system and is one of the most sensitive regions to climate change. Sea ice loss accelerates global warming, melting glaciers feed rising seas, and thawing permafrost destabilizes communities and releases greenhouse gases. Warming temperatures are affecting the Arctic region in countless ways, producing changes that have cascading effects on the Arctic's interlinked and delicately balanced ecosystem that extend well past the Arctic, impacting all global climates.

The WHOI /Woodwell presentation, *Refreeze the Arctic: Increasing our Ambition to Maintain a Safe and Stable Climate*, aims to reinforce the dire need for a stable Arctic and its connection to maintaining a safe global climate. Several aspects of Arctic studies, including a changing Arctic cryosphere and ecosystems, thawing permafrost, advances for monitoring sea change, field observations, and the urgency of global climate action to keep these systems intact, will be discussed by the five-person science team. WHOI and Woodwell Climate bring complementary expertise in Arctic land and ocean system studies with decades of combined experience as front-line witnesses to Arctic change..

The team consists of:

Dr. Carin Ashjian is a biological oceanographer and Chair of the Biology Department at WHOI whose research focuses on the impact of climate change on polar ecosystems. She has participated in over 60 oceanographic research cruises, including 19 on icebreakers, and in two year-long Arctic drift studies, most recently the international MOSAiC project in 2019-2020.

Dr. Richard Camilli holds joint appointments as a scientist in WHOI's Applied Ocean Physics & Engineering Department and as a research affiliate in MIT's Computer Science and Artificial Intelligence Laboratory. His research focuses on marine robotics and instrumentation development for environmental observation. He has participated in over 50 oceanographic research cruises worldwide and served on the US Environmental Protection Agency's Science Advisory Board.

Dr. Sarah Das is a glaciologist, educator, and explorer at WHOI. Her research focuses on investigating ice dynamics, climate history, ice-ocean interaction, and documenting recent change in Greenland and Antarctica. She has been leading scientific expeditions to the polar ice sheets for over 25 years and served on the U.S. National Academies' Polar Research Board.

Darcy L. Peter is a Research Assistant at Woodwell Climate Research Center and supports the Polaris Project under Dr. Sue Natali. Her research primarily focuses on greenhouse gas emissions, permafrost thaw, and Arctic ecology. Peter is Gwich'in Athabaskan and is working to build bridges between Northern communities, traditional knowledge, and

Western science.

Dr. Rachael Treharne is an Arctic ecologist at Woodwell Climate Research Center. She studies disturbances in northern ecosystems, with a particular interest in abrupt and difficult-to-predict processes. She is currently researching and modeling permafrost thaw and wildfire, and their implications for climate change.

The WHOI/Woodwell Climate delegation to COP26 also includes **Dr. Kilaparti Ramakrishna**, a senior advisor to WHOI on ocean and climate policy and a member of the Woodwell Board of Directors. Dr. Ramakrishna is a renowned ocean health and climate action policy expert, with decades of experience in driving climate solutions.

“Polar ice melt is now outpacing forecasts of a decade ago and from a historical perspective, today's melt rates are off the charts,” said WHOI's Sarah Das. “Changes from global warming already are rapid and dramatic, with deep impacts not only on the Arctic cryosphere, but on infrastructure, land, ecosystems and communities around the world. We are looking forward to sharing these pressing concerns for future Arctic health at COP26.”

“We're at a critical tipping point,” added Dr. Carin Ashjian. “Unraveling Arctic systems already have profound impacts on Northern communities and global climate, and we can't overstate how critical this global conference is in terms of tangible and measurable mitigation steps moving forward.”

Woodwell's Dr. Rachael Treharne added, “The rapid warming we're seeing in the Arctic has global implications. Frozen soils (or 'permafrost') keep carbon locked in the deep-freeze, away from the atmosphere. But as the ground warms and thaws that carbon becomes vulnerable to release. This process is not yet fully represented in climate models or carbon budgets – but it's critical that we recognize this has implications for mitigation efforts.”

“Science can provide critical insight into the challenges that rapid Arctic warming poses for local communities and the globe, but that science should engage Arctic residents and incorporate Indigenous knowledge,” said Woodwell's Darcy Peter. “Northern communities are on the front lines of climate change, facing threats to their health, homes, ways of life, and infrastructure. Their needs and perspectives must be an integral part of setting global climate policy.” ■