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Policy takeaways from COP27

While the outcomes of COP27 span scales and nations, we identified some of the outcomes that are most relevant to U.S. policy

Anneka Williams External Affairs Fellow



From November 6 to November 18, 2022, representatives from across the world gathered in Sharm el-Sheikh, Egypt for COP27. The annual Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC) has the goal of bringing together governments to accelerate and coordinate global efforts to address climate change.

Representatives from Woodwell Climate Research Center (Woodwell) attended COP27 in its entirety. Woodwell scientists with expertise in Arctic and tropical ecosystems took part in a series of panels and side events focused on the importance of accounting for permafrost thaw in global carbon budgets and pushing for the valuation and protection of tropical forests.

While the outcomes of COP27 span scales and nations, we identified some of the outcomes that are most relevant to U.S. policy.

- The U.S. signed on to the global methane pledge. Participants of the pledge agree to take voluntary actions to work to collectively reduce global methane emissions by at least 30% from 2020 levels by 2030.
- President Biden recommitted the U.S. to climate action and announced some new funding initiatives and partnerships as part of this commitment. These include \$100 million for global adaptation to climate change, \$150 million for disaster emergency response across Africa, and \$250 million for clean energy investment support in Egypt. Notably, this is still far below the U.S. fair share for international climate finance.
- At COP27, U.S. Climate Envoy John Kerry announced the Energy Transition Accelerator, a public-private initiative to promote renewable energy projects through carbon offsets.

- The U.S. joined the European Union in signing on to a historic loss and damage deal that could potentially provide funds to support developing nations that are particularly vulnerable to climate change. While the agreement sets the stage for negotiations on developing a funding mechanism, there is no money currently pledged, there are no commitments from any countries to contribute in the future, and there are no rules in place for how the money would be distributed.
- The U.S. joined several other countries in pledging a total of \$135 million in new funding for fertilizer efficiency and soil health programs with the goal of combating fertilizer shortages and addressing food insecurity.
- At COP27, U.S. Secretary of Agriculture, Tom Vilsack, highlighted the U.S. Department of Agriculture's initiatives and investment in climate-smart forestry and agriculture and announced a new online platform for international collaboration to support countries and producers most vulnerable to global climate change.

In the realm of tropical forests, Brazil, Indonesia, and the Democratic Republic of the Congo launched a formal partnership to cooperate on forest preservation. Related to Woodwell's work on permafrost thaw and Arctic science, Chile and Iceland launched the Ambition on Melting Ice, a coalition of governments that will focus on helping political leaders and the public better understand the impacts of snow and ice loss globally.

As countries work to address climate change globally and domestically, Woodwell is committed to supporting strong, science-backed climate policy that can be used to help inform different efforts to address global climate change.

The importance of forest nations allying for climate action

A new alliance for forest protection comes amid trends of mounting deforestation

Sarah Ruiz Science Writer

This year, at COP27, Brazil, the Democratic Republic of Congo (DRC), and Indonesia signed a Forest Nations Alliance, declaring their intent to work together in achieving global deforestation goals. Together, these three countries hold over half of the world's tropical forests. These forests are vital carbon sinks, the loss of which could result in an additional 1 degree of warming. But across the globe, deforestation has been trending upwards, placing mitigation goals at risk. The question is whether this new alliance can help move the needle in the right direction.

The new alliance comes at a crucial time for forests. In 2021, leaders of more than 100 nations at the COP26 climate

subsistence agriculture. Most of the DRC's rural population depends on natural resources for their livelihoods and are often forced to clear forests to feed their families.

Indonesia, in contrast, has seen record low deforestation rates in recent years, reducing forest loss for five years in a row. However, experts say a rebound is still possible if government policies don't reinforce this success.

Despite these differing rates and drivers of deforestation, these influential tropical forest nations have united around a common goal. In effect, the alliance "unionizes" forest countries, making them a more formidable negotiating entity than any single country would be on their own.

"What they're saying is 'we're more powerful together,'" says Woodwell Tropics Program director, Dr. Michael Coe. "Somebody has to be in the driver's seat making changes and this way they are the ones doing the driving, rather than being driven."

The agreement states that the nations will be pushing for payments in exchange for their work in reducing deforestation, and they will negotiate for a new "sustainable funding mechanism" to help developing countries preserve biodiversity.

"Negotiating as a block, these three countries are now well positioned to maximize the financing they desperately need to implement sustainable development and conservation objectives while ensuring the flow of capital remains stable over the long term," says Carbon Program director Dr. Wayne Walker.

Looking ahead to 2023, there is optimism that Brazil will strengthen its forest policies as newly elected president Luiz Inacio "Lula" da Silva has pledged to end deforestation in the Amazon, stating, "There is no climate security for the world without a protected Amazon."

If successful in advancing their goals, the alliance could attract other tropical forest nations to lend their support. Though we are currently not on track to halt deforestation by 2030, the creation of this alliance is a step in the right direction.



conference in Glasgow declared a renewed commitment to halting forest loss and degradation by 2030. That pledge was accompanied by a 12 billion dollar pledge to address wildfires, and support restoration and Indigenous rights. However, analyses one year later declared the pledge "off to a slow start" and gave the world a D- grade on reversing deforestation trends.

In 2021, Brazil saw a 72% increase in the rate of deforestation compared to the prior three years. Much of this was associated with illegal occupation of public lands or unpermitted deforestation on private lands. Early numbers for 2022 show that trend continued with an estimated 10,057 square kilometers of forest lost in the Amazon between January 1 and December 2.

In the DRC, forest loss is driven mostly by low-yield, smallholder,

Arctic issues gain traction at COP27

Woodwell's leading cryosphere scientists advanced global recognition of permafrost thaw and related impacts at this year's climate conference

Jessica Howard Arctic Communications Specialist
Sarah Ruiz Science Writer

Amid the desert surroundings of this year's UNFCCC Conference of the Parties (COP27) in Egypt, Woodwell scientists called out the urgent climate crisis in the Arctic, which is impacting both local communities and the entire planet. 82% of climate models in use by the Intergovernmental Panel on Climate Change (IPCC) do not represent carbon emissions from thawing permafrost. As a result, the world's policymakers are underestimating how aggressively we need to reduce fossil fuel emissions to avoid the worst consequences of climate change.

At COP27, a team from Permafrost Pathways was pushing to highlight permafrost thaw within the greater discourse and amplify the voices of Northern communities who are being most impacted by rapid Arctic warming. Although action at this year's conference was slow in getting off the ground, cover decision, and other outcomes built on this momentum with new declarations to step up mitigation, as well as pledges for loss and damage funding.

Declaration for Ambition on Melting Ice

Among the key developments for the cryosphere at COP27 was the launch of the Declaration for Ambition on Melting Ice (AMI)—a statement from 19 governments demonstrating commitment to keep the goal of 1.5 degrees of warming

alive to limit substantial losses in the cryosphere. Led by Iceland and Chile, with support from ICCI as Secretariat, this high-level group represents a broad coalition of countries elevating melting sea ice, glaciers, and thawing permafrost as urgent issues that must be addressed by political leaders and the public both within and beyond the mountain and polar regions.

Following the publication of the Special Report on Ocean and Cryosphere in a Changing Climate and ICCI's 2022 State of the Cryosphere Report, the AMI Declaration helps to raise the visibility of the cryosphere in climate negotiations. It also reinforces the need to include mountain countries with significant glaciers, as well as low-lying and island countries that stand to be impacted by rising seas, in the conversation.

"It's really exciting to see this come together and to see quite a few countries signing on to this declaration recognizing that this is an issue," said Dr. Rachael Treharne, research scientist at Woodwell and Arctic policy lead for Permafrost Pathways. "It's also nice to see so many of the AMI coalition members highlighting both the fact this is already something that is really important for communities living within cryosphere regions, including within the Arctic—particularly for Indigenous Peoples, but also that this is something that is globally important



with some very direct impacts for communities worldwide as well."

The founding of the AMI may yield coordinated interventions at future UNFCCC negotiations, improved alignment in national policy, new and strategic research approaches, and increased visibility of permafrost thaw among global scientists and policymakers.

Loss and damage discourse

"Loss and damage" was a consistent refrain at this year's climate conference—referring to the destructive impacts of climate change that have already occurred or can no longer be avoided. Worldwide, Indigenous Peoples, as well as women and youth, bear a disproportionate burden of loss and damage and representatives of these groups were pushing for compensation from top-emitting countries. In the Arctic, both economic loss and damage, relating to livelihoods and property, and non-economic loss and damage such as loss of life, biodiversity, and cultural heritage, are accelerating due to permafrost thaw and related impacts. Yet, Indigenous Peoples living within national borders of developed Arctic States are rarely represented or visible in the UNFCCC loss and damage discourse.

Historically, loss and damage has been a thorny issue in UNFCCC negotiations. At COP27, action to address loss and damage was expected by many to be a litmus test of success, after coordinated pressure from across civil society secured a spot for the issue on the official agenda. After a difficult process that continued well beyond the planned end of the conference, an historic agreement established a loss and damage facility. While the agreement is far from perfect, it's an astonishing step forward brought about by civil society action. Now, a difficult road lies ahead for implementing the fund, as well as making sure all impacted communities are brought to the table, including Arctic Indigenous Peoples. Furthermore, while reparations and the loss and damage fund are long overdue, more needs to be done to prevent climate harm and devastation from happening in the first place.

Hope for the future

Although COP27—like many conferences before it—did not fully capitalize on opportunities to avoid a worst-case climate scenario, Woodwell is keen to recognize steps forward. Permafrost Pathways, and many others working on Arctic and cryosphere issues, continued to inform decision-makers about the urgent need to address a warming Arctic, through events like Permafrost Day. Permafrost Pathways also supported the voices of Indigenous communities that are disproportionately impacted by permafrost thaw in ongoing discussions about Loss and Damage, adaptation, mitigation, and co-production of knowledge. And, thanks to new relationships and understandings gained at COP27, the Permafrost Pathways team is even more prepared to promote accurate global accounting of permafrost carbon emissions and to advocate for policy solutions that build on the momentum gained this year.

Story includes contributions from Melissa Shapiro and Rachael Treharne



Deciphering patterns in the dirt

Growing up on a dairy farm, observing a potential climate solution within America's rangelands

Sarah Ruiz Science Writer

At age 12, Woodwell Assistant Scientist, Dr. Jennifer Watts was accustomed to black dirt—the rich, wet, crumbling, fertile stuff she dug through on her family's hobby farm in Oregon. But after moving with her parents and siblings to a roughly 224-acre dairy farm in Minnesota, all she saw around her was light brown, dry earth.

"A lot of the farms around us were a mix of dairy farms and really intense cropping rotations of corn and soybean," Dr. Watts says. "And I started to notice, where there was tillage, how depleted the soil looked."

In the United States, farmland covers more than 895 million acres (an area larger than the size of India), and it has a proportionately massive footprint on the environment. Intensive agriculture pulls nutrients out of the soil and doesn't

always return them, converting natural grasslands into monocultures and releasing large amounts of stored carbon in the process.

But what Dr. Watts saw throughout a childhood spent tending to her family's farm, was that changing the way agricultural land is managed can sometimes reverse those impacts. In converting their cropland to pasture, to support an organic, grass-based dairy farm, Dr. Watts and her family stumbled upon the principles of regenerative agriculture. A practice that can produce food in a way that works with the ecosystem, rather than against it, and has implications for climate mitigation as well.

"It became, for me, an unintentional transformative experiment that my

family conducted on our farm,” Dr. Watts says. “By the time I graduated high school, our lands were so lush and green. It was a healthy, productive, diverse ecosystem again.”

Going rogue on the range

When Dr. Watts talks about her father’s idea to move to central Minnesota and start a dairy farm, she calls him a “rogue.” Originally from Alaska, he intended to work in fisheries, but had to change course after a cannery accident. Searching for something that would allow him to still spend his days outside, he settled on farming.

From the beginning, the Watts’ farming practices were considered unconventional in their rural Minnesota community. Firstly, they planted wild grasses and legumes like clover and alfalfa. Then, they left it alone. No tilling in the springtime alongside their neighbors; they simply let the plants establish themselves and moved the cattle frequently (with the help of a cow dog named Annie) to avoid overgrazing.

“After the first couple of years, I started noticing we had a lot more biological diversity in our fields, relative to our neighbors. We had a lot more bees buzzing, and butterflies, and we were popular with the deer and ducks,” Dr. Watts says. A few more years, and the soil started becoming dark and earthy-smelling again, like the soil she remembered from Oregon.

What was happening on their “rogue” dairy farm, was a gradual, partial reclamation of a lost grassland ecosystem—one that used to stretch across the midwest United States and was tended by native grazing species like bison or elk. Grazing plays a major role in cycling nutrients back into the soil, building up important elements like carbon and nitrogen. The near extinction of bison and the proliferation of monoculture cropping have broken this

cycle—but cows have the potential to fill the gap left by ancient grazers, re-starting that process. Simple adjustments to management techniques, like lengthening time between grazing a pasture, can give the land time to recover.

Storing carbon in the soil

This also has implications for how we combat climate change—a term Dr. Watts wasn’t familiar with until later in high school,



when family trips back to Alaska revealed the glaciers she loved to visit were shrinking.

“Seeing the glaciers was our favorite thing to do with my grandma, but they were beginning to disappear. And one year, suddenly, I noticed these informational panels along the walk exiting the National Park talking about this thing called climate change,” says Dr. Watts.

Dr. Watts was also seeing another pattern emerge on the farms in her midwest community. Water was becoming a little scarcer. Many of the farms around her family’s had begun investing in irrigation—something that was previously unnecessary, and remained so for the Watts’ farm. Their rich, black soil held onto the water for longer.

As she grew up and (with the help of a pre-Google web search over dial-up internet) charted a course for her career as an ecologist, Dr. Watts began to study the science underlying these patterns she was noticing, and connected them to climate change.

Growing plants draw carbon from the atmosphere. When plants die and decay, some of that carbon is released to the air to be drawn back down again by a new season of growth, while some is stored away as organic matter in the soil. Over centuries, this process forms a stable sink of carbon on the land. Regenerative grazing—the way the Watts family did it—stimulates more plant growth to keep this cycle turning, while overgrazing or removing grazers entirely can halt the process, allowing for erosion, less healthy root systems, and the degradation of the carbon sink. In the U.S., rangelands have historically contributed more to the depletion of soil carbon, but Dr. Watts’ research with Woodwell has demonstrated that, with proper management, rangelands and other agricultural lands have the potential to contribute positively to the climate equation again.

Seeing patterns from a new perspective

For the past two summers, Dr. Watts, alongside the Woodwell Rangelands team and collaborators, has driven across the western U.S. to collect biomass and soil samples and measure carbon flux from working ranches and federal grazing leases in Montana, Colorado, and Utah.

These measurements will help calibrate a new satellite remote sensing-informed model that can track how much carbon is being stored on grazing lands. The model will be hosted on the Rangeland Carbon Management Tool(RCMT) platform—a new web application she and researchers at both Woodwell and Colorado State University are developing to give land managers access to carbon and other ecosystem data for their lands.

The idea is that, with a tool like this in hand, ranchers can account for carbon dioxide flowing into and out of the rangeland ecosystem, and track how this changes over time in response

to land management adjustments. It will also show changes in correlating ecosystem metrics like plant diversity and productivity, as well as soil moisture—two things that are crucial to maintaining a healthy and economically viable range. With this information, Dr. Watts and colleagues hope to encourage a regional shift in ranch management strategies that protect and rebuild stores of soil carbon, while providing ranchers with essential co-benefits.

Dr. Watts has been working with Jim Howell, owner of sustainable land management company Grasslands LLC, to connect with individual ranchers and discuss how a tool like this could help their operations. Though ranchers can be a tradition-bound group, Dr. Watts says seeing data that confirms their anecdotal experiences of hotter winters, drier summers, longer droughts, and other climate-related changes has opened them up to making changes.

“There are so many times when we just see the ‘aha moment’ in the manager or the land owner’s face, because they’re suddenly able to see these patterns from a very different perspective,” says Dr. Watts. “Most people, we have strong memories, we know that something’s different, but to be able to show that through data and not only memories—it’s so powerful.”

Building climate solutions on the ground

In addition to ecosystem co-benefits, storing carbon on rangelands could have direct economic benefits for ranchers as well. The RCMT will provide baseline data that could be used to verify credits within a voluntary soil carbon market. Rangelands historically haven’t been included in carbon markets because of gaps in monitoring data that the RCMT will help fill. The data could also be useful for local or state governments setting up payments for ecosystem services schemes

in their region that would provide money directly to ranchers in exchange for storing carbon on their lands.

Of course, cattle aren’t without their complications, and ranching practices are just one element of a global meat and dairy industry that contributes to 15 percent of global emissions. But Dr. Watts’ roots as a dairy farmer make her enthusiastic about the possibilities this solution holds to both mitigate emissions and keep an important American livelihood resilient as climate conditions change.

“It’s just one aspect in this really complicated global system,” says Dr. Watts. “But if we manage our ecosystems better, building more intact environments where we can, this can sequester more carbon while restoring ecosystem health and productivity. It’s not the solution, but it is a solution that can benefit our planet while supporting rural communities.”

In the news: highlights

Dr. Jen Francis’ meteorological expertise was quoted in two different articles this week; a widely-syndicated *Verify* article explaining “bomb cyclones,” and a *Discover Magazine* article clarifying what the polar vortex really is. Jen was also mentioned in a *New York Times* article on the polar vortex.

Dr. Jen Francis discussed winter storms on an episode of *TILclimate*, a podcast by the MIT Environmental Solutions Initiative.

The Atlantic quoted Dr. Jacqueline Hung in an article on disproportionate warming in New England.

The World quoted Dr. Sue Natali on how the war in Ukraine poses challenges for Arctic permafrost research. Dr. Brendan Rogers was quoted on the same topic in a *Science Business* article.

IPAM quoted Dr. Manoela Machado in an article about a recent workshop for Indigenous fire brigade members, put on in collaboration with Woodwell.

Dr. Christopher Schwalm recommended a speculative fiction read in The Center for Climate Security’s 2022 favorites to read, watch, and listen to.

AP News quoted Dr. Jen Francis in a story on the latest estimate of climate damages. The story was syndicated to over 400 outlets, including The Washington Post.

Dr. Jen Francis was quoted in a widely syndicated *CNET* story about weather whiplash that was picked up by *MSN* and others.

AP News quoted Dr. Wayne Walker to provide context on the carbon stored in the Amazon in an article that was syndicated to over 550 outlets, including The Washington Post.

Dr. Foster Brown was featured in an article from *Globo* covering how the climate in Acre, Brazil is changing; the story was also referenced in another article on water challenges in Rio Branco (Portuguese).

Mongabay quoted Dr. Glenn Bush on how the scale of pledged international funding for forest protection is insufficient.

Dr. Ludmila Rattis calculated drought data for a *Washington Post* article on drought in the Amazon.

An article in *Phys.org* covered a recent paper co-authored by Dr. Nigel Golden on bolstering ecology by overcoming social-ecological landscapes of fear.

A *Robb Report* article on climate philanthropy mentioned Woodwell’s Permafrost Pathways.

An article from *Radio Taiga* covered the fire at Scotty Creek, and mentioned Woodwell’s involvement in replacing scientific equipment.

cover: Caribou Hills South meteorological station installation last month on the Kenai Peninsula, Alaska.
/ photo by Anna Liljedhal

Donations play an important role in securing the future of Woodwell Climate Research Center's work—and help safeguard the health of our planet for generations to come.

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