POLAR SCIENCE

Antarctic fast-ice trends

Cryosphere **15**, 5061–5077 (2021)

Credit: Enrique Aguirre Aves/The Image Bank/Getty

Fast ice — stationary sea ice attached to land or floating ice shelves — plays an important role in ocean–atmosphere interactions. In Antarctica, fast ice can be found over the continental shelf and ranges from 50–250 km wide, depending on location and climatic variability.

To understand changes that occurred from 2000 to 2018, Alexander Fraser of the University of Tasmania, Australia, and colleagues analyse the recently published NASA MODIS-derived 18-year dataset on the extent of Antarctic fast ice (at 1 km spatial and 15 d temporal resolution). They find that the continent has eight distinct regions that constitute a $-0.19 \pm 0.18\%$ per year trend (-882 ± 824 km^2 per year) in the change in area. There are four regions showing increasing trends, in East Antarctica and the Bellingshausen Sea, and four with decreasing trends, mostly in West Antarctica, with the largest in the western Ross Sea area. These satellite-generated baseline data provide information on bathymetric controls of fast ice, as well as information on annual variations in its extent, whilst highlighting the need for more studies to understand the possible impacts of climate change.

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AGROFORESTRY

More than skin deep

Agric. Ecosyst. Environ. **323**, 107689 (2022)

Natural climate solutions, such as planting trees, have been gaining popularity as potential mitigation techniques for climate change. However, such efforts generally involve the conservation or reforestation of large areas of land, making it, in some cases, difficult to balance these efforts with the need to use the land to support livelihoods. Agroforestry systems can be a compromise, with benefits for both people and carbon sequestration. Moreover, it is not just the trees themselves that can sequester carbon in these systems.

Stefanie Mayer from the Technical University of Munich, Germany, and colleagues conduct a meta-analysis to investigate the capacity for agroforestry systems in temperate ecosystems to sequester carbon in the soil. They determine sequestration rates for three types of systems: alley cropping systems, hedgerows and silvopastoral systems. They find that for most of the observations, the agroforestry systems had higher organic carbon content in the topsoil and subsoil, with hedgerows having the highest sequestration rates. Soil carbon sequestration was also higher for systems with broadleaf trees. These results highlight another benefit of agroforestry for climate change mitigation. *AF*

https://doi.org/10.1038/s41558-021-01239-8

TROPHIC CASCADES

Predators buffer impacts

Glob. Chang. Biol. https://doi.org/g5dm (2021)

The impacts of heatwaves — predicted to increase in frequency and intensity with climate change — can result in the extinction or forced migration of species. In the context of natural ecosystems, the loss of individual species has the potential to trigger a trophic cascade that leads to secondary extinctions, while the presence of particular species, structures or interactions may, alternatively, have a stabilizing, buffering effect.

Samuel R. P.-J. Ross, from Trinity College Dublin, Ireland, and colleagues in Japan, the USA and Ireland investigated the possible interactions between abiotic and biotic drivers of biodiversity change in a freshwater system, utilizing a two-factor experimental design with or without fish predators and altered heatwave presence and intensity. They demonstrate that the presence of fish with predators interacted significantly with heatwaves, helping to mitigate the destabilizing effects of heatwaves on algal communities, which is most likely due to the indirect effects of predators on macroinvertebrates. These findings highlight the need for more research into how community structure and biotic interactions influence ecological resilience to climate change. *TAM*

https://doi.org/10.1038/s41558-021-01242-z

INTERNATIONAL RELATIONS

Shaming as pressure

Int. Organ. https://doi.org/g5dg (2021)

Credit: Siraj Ahmad / Alamy Stock Photo

The Paris Agreement marks a significant step toward international collaboration on climate change. However, many scholars and policy professionals are concerned that countries may not honour their Paris pledges. Some believe that naming and shaming, that is, denouncing countries publicly for failing to meet their commitments, could effectively reduce wrongdoing through increasing domestic support.

Dustin Tingley of Harvard University and Michael Tomz of Stanford University, USA, examine whether and how naming and shaming affects domestic support for compliance with the Paris Agreement. This research, based on online experiments with national representative samples in the USA, shows that shaming by foreign countries can increase public support for compliance, and the approach is most effective for partial compliers: countries that make only partial progress toward the stated goal.

They further find that counter-rhetoric, such as contrition, can reduce the pressure caused by shaming. Finally, responses differ by political party; Democrats were more responsive to shaming than Republicans. Their findings demonstrate both the strengths and the limits of shaming as a tool of enforcement. *LY*

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