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Press contact: Katie Pflaumer
kpflaumer@ametsoc.org

Researchers: “Sustainable Adaptation” Must Drive Climate Strategy

A Special Collection in Weather, Climate, and Society aims to help climate leaders avert unintended harm

[Boston, MA—June 15, 2023] A [special collection of papers](#) in the American Meteorological Society journal *Weather, Climate, and Society (WCAS)* discusses the vital need for “sustainable adaptation”: strategies for adapting to climate change that do not worsen greenhouse gas emissions, biodiversity degradation, or social and economic inequality. Commissioned by [Noradapt](#), a virtual research center funded in 2019 by the government of Norway to help improve the country’s climate adaptation following sustainable development principles, **the papers in the collection highlight vulnerabilities and dangers to the way governments are currently moving to address greenhouse gases or protect against climate impacts.**

Recent research has begun to focus on “maladaptation”—how attempts to protect against climate impacts might harm vulnerable groups or get in the way of greenhouse gas (GHG) reduction. An example might be displacing a poor neighborhood or destroying carbon-storing marshland to build a seawall. The other side of the coin—“malmitigation,” the negative consequences of attempts to reduce atmospheric GHGs or capture carbon—is rarely addressed, even by organizations like the IPCC. According to Carlo Aall, senior researcher and professor in sustainable development at the Western Norway Research Institute, leader of Noradapt, and an author of several papers in the collection, “The biggest example [of potential malmitigation] is the whole transition from fossil to renewable energy, because most renewable energy is powered by climate” such as precipitation and wind. “If you swap the fossil and renewable energy system without taking adequate precautions, you will have a more climate-vulnerable society.” [Aall and colleagues’ paper](#) assessing the green energy transition in Norway found that most planners do not see reason for concern, but that actual research into these potential climate vulnerabilities has been alarmingly minimal.

The concept of sustainable adaptation is intended to address such issues—“to integrate adaptation and mitigation—and then on top of that, biodiversity and global justice [concerns],” says Aall. In the [overview paper](#) at the center of the collection, Aall

and colleagues lay out a framework to help decision-makers work with sustainable adaptation in mind. According to their proposed standard for “strong sustainability,” adaptation measures to reduce climate risks must also improve social and environmental sustainability by decreasing GHGs, addressing the fundamental drivers of climate risk, and safeguarding biodiversity, and must be driven by participatory decision-making. Such measures usually require transformative social change—for example, placing higher values on biodiversity, and planning out land use better in advance. “It’s often cheaper in economic, but higher in political, costs. ... [So] it’s not an easy fix, but it’s a signpost to lean towards.”

Building better interventions

An illustration of more sustainable decision-making is the renowned Norwegian tourism destination of Vossvangen, which built its cultural center in a location deemed safe from most flooding—until it was inundated in 2014. Regional flood maps failed to incorporate local historical data, such as church records that showed major flooding in recent centuries. “Adaptation right now is a very inside-the-office kind of thing. Officers have to spend more time going out and talking with the [local] inhabitants to get better information for planning,” says Aall. Climate and hydrological models may need some adapting to work with these non-numerical data, but Norwegian researchers took on the challenge readily and used historical information to change their flood maps of Vossvangen.

The Western Norway Research Institute advised the town that “instead of trying to tame the river, they should learn to live with the river.” Rather than relying solely on accurate flood forecasts, Vossvangen now has land-use regulations requiring that the lowest levels of buildings be adapted to potential flooding.

Addressing uncertainty and conflict

Other papers in the collection address topics including:

- **Uncertainty:** A [paper by Aall and Kyrre Groven](#) points out that too often, uncertainty around climate impacts leads to government inaction—for example, waiting to build flood infrastructure until they are certain about how large the danger zone will be. The authors argue that governments must act despite large uncertainties, and they establish a framework for doing so. “The traditional way of working with adaptation is ‘predict and engineer,’” Aall says. He refers to his suggested approach, as illustrated by Vossvangen’s government post-flood, as “reflect and act.”
- **Nature-based solutions:** [Dag Hessen and Vigdis Vandvik](#) use examples from Norway to show the key role of intact ecosystems in climate adaptation and mitigation as well as human health. They note that while Norway has positioned itself as a climate leader, it has not developed comprehensive policies for maintaining existing ecosystems like wetlands and permafrost, which currently store 31% of the nation’s terrestrial ecosystem carbon. In addition, construction of roads and buildings—along with wind and water power facilities—is projected to increase, with the potential to drive significant habitat destruction. In another paper, [Karin Marie Antonsen, Brigt Dale, and Stephanie Mayer](#) use the example

of the Lofoten Islands in Norway to discuss the potential role of nature-based tourism in adaptation strategies, but also show the vulnerability of tourism-based economies to cascading ecological changes and to crises like COVID-19 that restrict travel.

- **Traditional knowledge:** A paper by [Camilla Risvoll](#), [Grete K. Hovelsrud](#), and [Jan Åge Riseth](#) notes how the traditional knowledge of reindeer- and sheep-herders in northern Norway is largely ignored by government and land-use planners. Increased construction that fragments grazing habitat, for example, means that animals must stay in smaller areas. They may be left more vulnerable to disease, or unable to reach optimal feeding or calving areas. Meanwhile, predator management agencies seem to ignore reported damages to herds, putting further pressure on pastoralists' livelihoods. Planners must take the views and experiences of local and indigenous peoples into account when it comes to managing local climate variability, especially when it comes to climate adaptation strategies that require maintaining and managing natural areas.

In general, says Aall, research on climate adaptation must be scaled up to match the approximately 20-fold-higher investment in mitigation research, and the field must encourage public participation. Governments and nonprofits are too often afraid to publicly discuss adaptation, he adds, because “[To them,] adaptation is giving up.” The papers in the WCAS collection argue otherwise—adaptation and mitigation must be part of a comprehensive strategy that also benefits society. The collection will help governments, NGOs, and planners keep those allied goals in mind when considering how to move forward.

Browse the collection: [Sustainable Climate Change Adaptation](#)

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The American Meteorological Society advances the atmospheric and related sciences, technologies, applications, and services for the benefit of society. Founded in 1919, AMS has a membership of more than 12,000 professionals, students, and weather enthusiasts. AMS publishes 12 atmospheric and related oceanic and hydrologic science journals—in print and online; sponsors more than 12 conferences annually; and offers numerous programs and services. Visit us at <https://www.ametsoc.org/>.

About *Weather, Climate, and Society*

[Weather, Climate, and Society \(WCAS\)](#) (ISSN: 1948-8327; eISSN: 1948-8335) publishes research and reviews that address economics, policy analysis, political science, history, communication, and institutional, social, health, and behavioral scholarship and research relating to weather and climate, including both climate variability and longer-term climate change. Contributions must include evidence-based analysis and substantive discussion of the interactions of weather and climate with society, taking an integrated approach, drawing on both social and physical sciences.

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