

## HYDROCLIMATE

### Extreme rain in India

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In late August and early September, 30 million people were affected by widespread flooding in India due to extreme rainfall. Such events have become increasingly common in recent decades, but coincide somewhat counter-intuitively with a long-term reduction in mean precipitation and a corresponding decline in the frequency of rain-bearing depressions.

Mathew Roxy from the Indian Institute of Tropical Meteorology and colleagues quantify changes in extreme rainfall across the Indian sub-continent, and further diagnose the mechanisms responsible for such enhanced hydroclimatic variability in the region. They use a combination of observations, reanalysis products, and results from a dynamic recycling model.

It is found that extreme rain events have increased threefold over central India during 1950–2015. The authors attribute this change to enhanced variability in the low-level monsoon winds over the

northern Arabian Sea, themselves linked to patterns of surface warming and impacts on land–sea thermal contrasts. As a consequence, these low-level westerlies bring surges of moisture over the sub-continent, promoting episodic extreme rainfall. Projected warming of the Arabian Sea indicates these extreme events may continue in the future, thus presenting a sustained threat to life and livelihood in central India. GS

## CLIMATE ADAPTATION

### International governance

Eur. J. Int. Relations <http://doi.org/cd6b> (2017)

In recent years the United Nations Framework Convention on Climate Change (UNFCCC) has increasingly addressed adaptation alongside long-standing efforts to mitigate greenhouse gas emissions. Although there is a growing literature on how countries and communities are preparing for, and dealing with, the impacts of climate change, global adaptation governance has remained relatively understudied.

To begin to address this, Nina Hall from the Johns Hopkins School of Advanced International Studies, Italy, and Åsa Persson from the Stockholm Environment Institute, Sweden, examine adaptation governance under the UNFCCC, and the degree to which it has been legalized.

They find more attempts to govern adaptation than are revealed in most existing ‘mitigation-focused’ accounts of climate governance. They go on to analyse UNFCCC documents, secondary literature on adaptation initiatives and institutions, interviews with experts and

negotiators. They find that adaptation governance is low in precision — rules are typically ambiguously defined — and low in obligation — rules are not usually legally binding. They suggest this is because adaptation is a contested global public good and because ‘package deals’ are made with mitigation commitments. AB

## RENEWABLE ENERGY

### Sea breeze

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<http://doi.org/cd6c> (2017)



TOMASZ KOZAL/ALAMY STOCK PHOTO

Energy transition requires a growth in green power, and wind energy is one such growing industry. Turbines extract kinetic energy from wind and convert it to electricity, but without downward transport of kinetic energy from higher in the atmosphere to replace the extracted energy, the size of wind farms and spacing of turbines contribute to limit the rate of electricity generation.

Most wind farms are located on land with generation limits of ~1.5 W per m<sup>2</sup> for large farms; however wind speeds are often greater over the ocean. There are now a number of offshore wind farms, predominantly in shallow coastal areas, whereas the strongest winds are further offshore. To understand the potential of an open ocean location, Anna Possner and Ken Caldeira of the Carnegie Institution for Science, Stanford USA, investigate where wind speeds are greater and if there is downward replacement of energy. They show that the North Atlantic is a region where transport of energy from above may be greater than that on land. Potential limitations are the seasonality of winds and the lack of technology suitable to withstand the open ocean environment. However giant wind farms in this location could, theoretically, provide energy to meet current world demand. BW

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## MEDIA COVERAGE

### Portraying indigenous peoples

Climatic Change <http://doi.org/cd57> (2017)

Indigenous peoples inhabit regions already experiencing effects of climate change. Because Indigenous peoples are often absent from climate-change research and policy, and tend to be geographically isolated with less access to institutional power, media portrayals may be particularly important for shaping public understanding of Indigenous issues and generating public pressure to support these communities.

Ella Belfer from McGill University and colleagues analysed articles focused on both climate change and Indigenous peoples published in the period 1995–2015 in the two newspapers with the largest national circulation from each of Canada, the US, Australia and New Zealand. Indigenous peoples were framed as victims of climate change, but coverage ignored legacies of colonialism and marginalization that has made them especially vulnerable. Impacts were typically discussed at the regional level, whereas mitigation and adaptation were described at the national level, notably neglecting community impacts and responses. Indigenous knowledge was most valued when it corroborated scientific knowledge or conformed to romanticized stereotypes. Thus, coverage of Indigenous peoples is used to promote the importance of broader mitigation efforts to the general public, rather than initiatives that would directly support Indigenous communities. JR