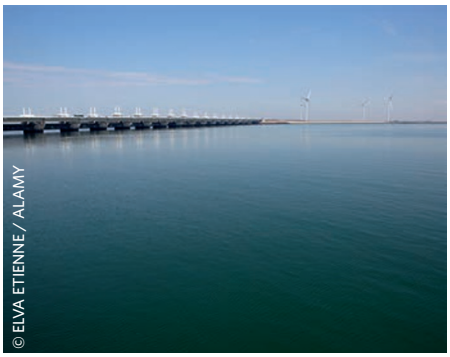
POLICY

Flood risk governance

Water Res. Manag. http://doi.org/tn5 (2014)



Flooding risk is increasing in European cities due to urbanization and climate change. Managing flood risk requires adequate governance arrangements — such as administrative structures and rules — but these are rarely assessed.

Dries L. T. Hegger, of Utrecht University, The Netherlands, and colleagues propose to evaluate the governance of flood risk arrangements with a framework that integrates insights from policy scientists and legal scholars — the policy arrangements approach (PAA). PAA assessments link all relevant aspects of a policy arrangement including actors, discourses (scientific paradigms, policy objectives, historical narratives and values), rules and resources. Using PAA, the researchers assess flood-risk governance on the island of Dordrecht, where the Dutch risk-based approach known as multilayer safety has been applied. Specifically, several steps have been taken to organize the area into compartments with different flood safety regimes. Hegger and colleagues analyse the different governance arrangements in place and conclude that such diversification will probably increase resilience to flood risk, be effective in terms of goal achievement and be endorsed by the actors involved.

According to the authors, comparative analyses in different countries are now needed to allow experts to draw lessons about the possibility of generalizing results. Although PAA has been applied to flood risk, they suggest it could be used to analyse governance in other contexts. *MC*

CLIMATE IMPACTS

Wind ups ocean heat

Geophys. Res. Lett. http://doi.org/tnv (2014)

The westerly winds that dominate the Southern Ocean also interact with the upper ocean. Since the 1950s, there has been a strengthening and poleward shift of the winds and the impact of these changes on the ocean and its heat distribution are uncertain. Climate change is projected to cause the trends to continue, so it is important to gain understanding of the wider impacts.

To address this knowledge gap, Paul Spence, of the University of New South Wales, Australia, and colleagues use an ocean sea-ice model to examine Antarctic coastal subsurface ocean heat changes on decadal timescales. The team consider the impact of the observed and projected wind changes.

They find the wind shift can increase subsurface (200–700 m depth) water temperatures by up to 2 °C. This is a result of decreased wind-driven vertical water movement, a slowing of the coastal current and the warm water layer moving upwards to the surface. The increase in ocean temperature around ice sheet grounding lines and beneath floating ice sheets could have significant impacts on melt rates and therefore global sea-level rise. *BW*

CLIMATE IMPACTS

Fire fuels change

J. Geophys. Res. http://doi.org/tnt (2014)

The burning of vegetation — biomass burning — impacts on climate and air pollution. The fires produce gases and particles that interact and change the atmosphere and clouds. Most biomass burning is human-caused, resulting from land-clearing and land-use change, with a small proportion due to natural causes.

Mark Jacobson, of Stanford University, USA, uses a 3D global model to simulate biomass burning, considering heat and moisture fluxes, major gas and particle components (such as black carbon), particle effects on clouds and cloud absorption effects (such as heating). Over a 20-year period, biomass burning caused a net temperature increase of 0.4 °C globally, largely because of cloud absorption effects. In particular, the absorption of particles within water droplets or ice in clouds accounted for 32% of the warming. The presence of absorbing particles in clouds causes them to burn off, resulting in increased sunlight reaching the surface and raising the temperature.

Additionally, biomass burning was estimated to cause around 250,000 premature deaths per annum, with the majority due to particulate matter. This work highlights the need to reduce biomass burning for human and planetary health. *BW*

BIODIVERSITY

Conserving immigrants

PLoS ONE http://doi.org/tn2 (2014)

Global climate change is altering the distribution of many species and this will have implications for the mix of species that thrive in a given country. Conservation efforts rely heavily on public funding and therefore require public support. Public acceptance of the coming and going of species could, therefore, be an important stumbling block for conservation in a changing climate.

Using the case of Denmark, Thomas Lundhede, from the University of Copenhagen, Denmark, and co-workers investigate whether the Danish public are as willing to pay for the preservation of immigrating bird species as they are for native species currently breeding in Denmark. They find that Danish citizens are willing to pay much more for the conservation of birds native to Denmark, than for bird species moving into the country. These preferences held even when individuals were informed about the potential shifts in species range associated with climate change and were independent of individuals' levels of expertise. However, there was greater willingness to pay for the preservation of immigrant species that were under pressure across Europe. These findings reveal some challenges for international coordination of conservation efforts under climate change. *AB*

Written by Alastair Brown, Monica Contestabile and Bronwyn Wake.