CONSERVATION

Arctic migratory birds

Glob. Change Biol. http://doi.org/bksb (2016)

Rapid climate change in northern high latitudes has the potential to affect millions of migrating birds. Climatic impacts on the timing of migration are relatively well researched but consequences for the spatial distribution of species throughout their migratory cycles remain insufficiently studied.

To address this gap Hannah Wauchope at the School of Biological Sciences, University of Queensland, Australia, and colleagues modelled the climatically suitable breeding conditions of 24 Arctic specialist shorebirds and then projected them out to 2070 to investigate how they might change in response to warming in the region.

They find that in their simulations, climatically suitable breeding conditions alter quite drastically, with 66–83% of study species losing the majority of currently suitable breeding grounds by 2070. These projected changes in conditions may affect the species composition of the world's major migratory flyways. Something of a silver lining lies in the fact that protected area coverage generally meets target levels in both current and projected future climatically suitable areas, though there remains room for improvement, particularly within the Canadian Arctic. *AB*

OCEANOGRAPHY

Feeling the heat

Oceanography http://doi.org/bksd (2016)

During the winter of 2013–2014, a warm-water anomaly formed in the northeastern Pacific Ocean, persisting until early 2016. This 'blob', as it became known, altered the physical properties of the marine environment. For example, increasing stratification in the region — impacting mixing and upwelling, which affect the marine ecosystem.

Letícia Cavole and colleagues at Scripps Institution of Oceanography, University of California San Diego, USA synthesize the biological impacts of the warm anomaly, and consider how representative the event may be of future climate. In the south, the increased stratification reduced the mixing of nutrient-rich waters to the surface and there was an observed reduction in phytoplankton biomass. This decrease in food source, along with higher temperatures, resulted in zooplankton and invertebrates species shifting northward to cooler waters, followed by the predators. Although there was a decrease in phytoplankton in the south, there was an unprecedented increase in harmful algal bloom species in the north.

The elevated temperatures seen during this period were comparable with those expected in the second half of this century under climate change. Although the blob was confined the surface waters, and climate change will see more generalized warming, there is still expected to be an increase in stratification and other physical changes such as those observed. As such, the observed changes are an indication of what may be ahead. *BW*

ARCTIC SEA ICE

Open water drivers

J. Geophys. Res. Atmos. http://doi.org/bksf (2016)

Sea ice is decreasing in the Arctic but year-to-year variability in sea ice extent is large. Ice extent is influenced by atmospheric circulation, with temperatures dictating ice melt, and winds shifting the ice. To investigate the link between atmospheric circulation patterns and regional sea ice changes, Amanda Lynch of Brown University, Rhode Island, USA and colleagues use a self-organizing map framework. They use satellite data of daily sea ice extent to calculate monthly mean open water areas, and reanalysis sea level pressure data to compare the Pacific and Atlantic sectors.

They find that the September open water fraction is increasing more rapidly in the Pacific than the Atlantic sector, with the Pacific also experiencing greater variability, which they attribute to consistent ice export in the Atlantic sector. In years with greater sea ice loss, and therefore a larger open water fraction, the mechanism is the same for both sectors, with warmer temperatures melting ice and southerly winds driving the remaining ice towards the pole. However, in years with more ice and less open water, the authors' find two different mechanisms at play — cooler temperatures or transport of ice to the south, the latter of which would reduce ice thickness. *BW*

NATURAL DISASTERS

Long-term social impacts

Sociol. Forum http://doi.org/bksc (2016)

Assessing the long-term impact of natural disasters on the people caught in them is difficult as it requires access to respondents both before and after the disaster.

Mary Waters and colleagues, working on the Resilience in Survivors of Katrina (RISK) project had a rare opportunity to gain such insight by analysing the impacts of the hurricane on a sample of ~1,000 predominantly young African American women who had already agreed to participate in a separate study.

Surveys and interviews with this vulnerable group allowed the researchers to uncover hidden aspects of recovery. They found high levels of mental and physical illness among respondents, as well as high levels of relocation. Decisions on whether to return were largely based on access to social networks and feelings of displacement, rather than quantitative decisions regarding economic or educational opportunities.

The research, which forms part of a special issue on risk, climate and the environment, shows how mixed-method, multi-disciplinary, longitudinal research can cast light on the differences between the sometimes obvious recovery of places and the hidden difficulties people experience after major disasters. *MH*

Written by Alastair Brown, Mat Hope and Bronwyn Wake.