MCCIP Marine Climate Change Impacts Partnership

Dear MCCIP news subscriber,

The MCCIP website has recently been updated with new marine climate change news and events. Below is a brief summary of the new items that have been added. For more details on all of the items listed below, simply go to **www.mccip.org.uk** and go to the relevant links in the 'news and events' box on our homepage. Please note that the material presented in MCCIP news does not necessarily reflect the views of MCCIP.

- **Satellite images reveal ocean acidification from space**
  The use of satellites to monitor ocean acidification is set to revolutionize the way scientists study the ocean as it will allow to scan large areas of inaccessible ocean. Up to now, satellite research in the OA context have been very limited, based on regional, empirical or derived data sets. Supported by good in situ measurements, especially in places with poor coverage such as the Arctic, satellite measurements are likely to become a key element in understanding and assessing OA. Researchers at the University of Exeter, Plymouth Marine Laboratory, Ifremer, the European Space Agency and a team of international collaborators are developing new methods that allow them to monitor the acidity of the oceans from space [DOI: 10.1021/es504849s].

- **Removing carbon dioxide and reflecting sunlight to cool Earth: Climate intervention**
  There is a growing interest in counter climate change measures. A report by the National Academies of the United States assesses two different classes of climate interventions in terms of their impacts, benefits and costs: (1) **carbon dioxide removal** and (2) modification of the **amount of sunlight reflected** by the planet's surface. Carbon dioxide removal strategies address a key driver of climate change, but is not yet clear if the technology is suitable for large-scale operations. Modifications to the amount of sunlight reflected by Earth could, potentially, cool

the planet's surface but again the risks and viability are not yet understood and therefore should not be deployed at climate-altering scales

- **Climate change to intensify coastal upwelling**
  Global warming may increase upwelling in several ocean current systems around the world by the end of this century, especially at high latitudes, causing changes in marine biodiversity. Wind-driven coastal upwelling along the eastern margins of major ocean basins brings nutrient-rich waters to the sunlit surface thus regulating the productivity of marine ecosystems. Climate models show that by the end of the twenty-first century the upwelling season will last longer and also become more intense at high latitudes, which will result in a substantial reduction of the existing latitudinal variation in coastal upwelling. These changes may influence the geographical distribution of marine biodiversity.

- **Sardines swim north to keep cool**
  Pelagic fishes (sardines, anchovies and mackerels) are among the most ecologically and economically important fish species in European seas. However, the warming of waters makes them vanish from their usual seas and migrate north, as confirmed by a pioneering study. Researchers warn that coastal towns dependent on these fishery resources must adapt their economies. Pelagic fishes have the potential to respond rapidly to climatic variability. Evidence has already been found of substantial climate-driven changes in the structure of pelagic fish communities in European shelf seas. In the last 50 years, distribution areas have shifted away from cold-water assemblages of Atlantic herring and European sprat, to warmer-waters assemblages of Atlantic mackerel, Atlantic horse mackerel, European pilchard and European anchovy. These shifts have been driven by changes in sea surface temperatures.

- **Fossils used to predict impact of global warming on marine life**
  Research from by the Natural History Museum and colleagues from Plymouth and Leeds have identified the causes of mass extinction of marine animals during past global warming events, which could help predict the future of marine ecosystems under the climate change we are currently experiencing. In the early Jurassic period, 'dead zones' of oxygen-poor waters spread near the sea bed, which led to the extinction of species. Oxygen-poor dead zones are indeed a major threat to modern shelf seas, and are driven by climate change but as well as by excess nutrient input. The addition of nutrients to the sea causes blooms of algae. When

these die and sink they strip oxygen from the water, creating deadly conditions in the water column.

- **Study reviews progress on local authority adaptation**
  The Sustainability Research Institute at the University of Leeds has published a report looking at how local government in Britain is making progress in adaptation to climate change. Comparing new data with similar evidence from 2003, the study shows that local authority staff now have good access to technical climate risk information. However, this knowledge and capacity to adapt is not translating into adaptation actions, seemingly because of budget cuts and a lack of support. The report includes useful insights based on real survey and interview data into the processes that drive adaptation at a local level.

News stories: If there are any relevant news items or events that you would like to highlight on the MCCIP website please contact Susana Lincoln at office@mccip.org.uk. New items will be added to the website next month.

Susana Lincoln
MCCIP Secretariat
The Centre for Environment, Fisheries and Aquaculture Science
Pakefield Road, Lowestoft, Suffolk, NR33 0HT, UK
Tel: +44(0)1502 524336 - Email: susana.lincoln@cefas.co.uk