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.

- **Fish out of their waters a warning sign of climate change impact**
  A new study published in **Global Change Biology** has shown that initial reports of fish in unaccustomed waters are often a sign of impending species-wide change, with major implications. Climate change is leading to changes in species distribution patterns across the globe. New marine species arriving in an area may become invasive, modify the local ecosystem, or represent challenges or opportunities for fisheries and recreation. It is therefore important to detect the early signs that fish may be moving into a new area, allowing for risks to be assessed and management strategies to be put in place.

- **Researchers worried about phytoplankton and climate**
  New research has found that a range of climate-induced stressors, including warming seas, increased ocean acidification, salinity reductions and sea ice, could potentially alter phytoplankton communities across the Southern Ocean. There is an apparent trend towards smaller-celled phytoplankton, which could affect their nutritional value for predators and the amount of carbon captured by the carbon pump. The changes are unlikely to become apparent until mid-century, but by that time the changes could be too far progressed to mitigate or reverse.

- **Marine "hotspots" under dual threat from climate change and fishing**
  New research published in **Science Advances** identifies six marine "hotspots" of exceptional biodiversity in the tropical Pacific, southwestern Atlantic, and western Indian Oceans. These areas have the most varied mix of species but are also

seeing the biggest impacts from a warming climate and commercial fishing. A combination of warming sea temperatures, weakening ocean currents and industrial fishing are putting these areas at particular risk of losing many of their species.

- **Climate change's impact on ocean floor will have significant global consequences**
  An international study suggests food supplies for seafloor ecosystems will decline by 50 per cent and the impact will have a significant impact on the planet. The study focused on areas between 200m-6,000m down, looking at increased seabed temperatures, falling oxygen levels and increasingly acidic water. The organic matter cycling that occurs in the deep sea helps to buffer the ocean against pH changes and the effects of ocean acidification. Abyssal ocean environments, are some of the most food-deprived regions on the planet. But a combination of temperature rise, deep sea fishing and mineral mining at hydrothermal vents can have devastating impacts on ocean floor ecosystems.

- **Rapid emergence of climate change in environmental drivers of marine ecosystems**
  Climate change is expected to modify ecological responses in the ocean, with the potential for important effects on the ecosystem services provided to humankind. A recent study found that, within the next 15 years, the climate change-driven trends in multiple ecosystem drivers emerge from the background of natural variability in 55% of the ocean and propagate rapidly to encompass 86% of the ocean by 2050 under a ‘business-as-usual’ scenario. However, the same study also shows that climate change-induced stress can be drastically reduced via climate mitigation. Mitigation slows the pace at which multiple drivers emerge, allowing an additional 20 years for adaptation in marine ecological and socioeconomic systems alike.

- **Risky business: calculating climate change losses in major European coastal cities**
  A new study that assesses potential future climate damage to major European coastal cities has found that, if, as currently, global carbon emissions continue to track the Intergovernmental Panel on Climate Change's worst emission scenario (RCP8.5), overall annual economic losses may range from 1.2 billion USD in 2030 to more than 40 billion by 2100.

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.

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