



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.

- **[Is climate change an unforeseen, irresistible and external factor – A force majeure in marine environmental law?](#)**

Several environmental laws include provisions on natural causes or force majeure, which exempt States from their commitments if they can prove that the failure to meet the commitment is outside their control. The European Union Marine Strategy Framework Directive (MSFD) has a pivotal role in managing EU marine waters. This paper analyses natural causes and force majeure provisions of the MSFD and other marine legislation, and addresses their interaction with climate change and its consequences, especially the effect on the obligation of ensuring seas are in Good Environmental Status.

- **[Climate change impairs survival instincts of fish and can make them swim towards predators](#)**

Research into the impact of rising CO₂ has shown it can disrupt the senses of fish including their smell, hearing and vision. High CO₂ levels can impair the way they behave, including making them swim towards predator smells instead of away and even ignoring the sounds that normally deter them from risky habitats. According to a **paper** published by climate-change marine biologists at Exeter University, these abnormal behaviours have been linked to the effect of CO₂ on how the brain processes signals from sensory organs. CO₂ levels are predicted to be 2.5 times higher in the oceans by the end of this century, and fish farms may be key to establish the long-term impact of CO₂ on marine life.

- **The ocean is losing its breath – and climate change is making it worse**

The world's oceans, coastal seas, estuaries, and many rivers and lakes are experiencing declines in dissolved oxygen. Long known as an issue associated with sewage discharges and fertilizer runoff, the problem now is exacerbated by climate change, often independent of nutrient loads, and is global in scale. If left unchecked, this decline will result in losses of fisheries and biodiversity, poorer water quality, and knock-on effects ranging from falling tourism to reduced marine ecosystem services. In 2015, scientists from around the world formed an IOC (Intergovernmental Oceanographic Commission)-UNESCO working group called the Global Ocean Oxygen Network or GO2NE to raise awareness about deoxygenation, and stimulate research and policy to understand and mitigate it.

- **Warming triggers early algae blooms, potential ripple effects to come**

Warmer oceans are acting like a catalyst for one of the world's most abundant species of plankton, triggering earlier blooms of blue-green algae in the waters of the North Atlantic. Because of plankton's fundamental role in the marine ecosystem, researchers expect this shift to have far-reaching impacts throughout the world's oceans. A new **study** published in *Science*, focused on *Synechococcus*, a type of blue-green algae that is one of the most abundant phytoplankton in the ocean. For every degree increase in water temperature, they found, the plankton bloomed four to five days earlier. Some migratory whales and other marine creatures have synchronized their own lifecycles to the blooms. As a result, scientists have theorized that changes in the timing of these events could lead to a "mismatch" between predator and prey along the marine food chain.

- **Fish turn on genes to adapt to climate change**

Certain marine species could adapt quickly to climate change by tinkering with their genes. Recent research has found that the types of winter skate were changing their body structure to better suit the area's warmer waters. But they were not evolving. Instead, they were simply switching which genes they chose to "turn on". This form of adaptation is caused by epigenetic changes, and it is different from the normal process of evolution. Unlike evolution, this process is extremely quick (days) which means that certain species could be better equipped to deal with rapid changes in climate. This is particularly the case for species that have a longer life span and lower reproductive rates, like the skate.

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

[forward to a friend](#)

Copyright © 2016 Marine Climate Change Impacts Partnership All rights reserved.

Our mailing address is:
office@mccip.org.uk

Find more: For more stories on marine climate change, follow [@MccipOrgUK](https://twitter.com/MccipOrgUK)

[unsubscribe from this list](#) | [update subscription preferences](#)