

A Changing Climate for Maritime Biodiversity: linking science to practice – Case Study

Climate Change and Seabirds

Helen Booker, RSPB



Storm petrel (Mark Bolton)

The Issue

Seabird populations in the UK were increasing until 2000 but since then there have been declines, which have likely been driven by poor breeding productivity. Climate change is one of the factors which can affect productivity. The SW is an important site for breeding seabirds, with 18 species breeding regularly in the region.

Seabirds can be affected by climate change in a variety of ways. Changing sea temperatures and acidity levels caused by climate change can affect the species upon which seabirds feed – changes in food availability at crucial stages in the breeding cycle can, therefore, impact on the breeding success. Storm events, which could become more frequent and intense as the climate changes, can also affect adult bird survival through starvation or exhaustion.

Changes in oceanographic fronts also have an effect as they concentrate prey species, e.g. zooplankton/fish, and are key foraging hotspots. Weak fronts in recent summers have meant that fewer zooplankton and fish are brought to the surface, making it more difficult for surface feeding seabirds to find food. Future studies in the South West are planned to investigate the influence of (climate-driven) changes in frontal intensity on large marine vertebrates, including seabirds.

Case study from 'A Changing Climate for Maritime Biodiversity' conference, November 2009

How is climate change effecting seabirds?

Three examples of species that could be affected by climate change in the South West are the European storm petrel, Balearic shearwater and Kittiwake.

European Storm Petrel

Storm petrels may be an unusually good indicator of oceanographic change because they feed low in the food chain, on zooplankton. Data from SAHFOS (Sir Alistair Hardey Foundation of Ocean Science) show that the abundance of the major component of zooplankton has declined by 70% since 1958 in the North-East Atlantic and there has been a change in species composition, which is related to changes in the sea surface temperature (much less of the cold-water *Calanus finmarchicus* and more of the warm water *Calanus helgolandicus*).

RSPB is conducting research at one of its nature reserves in Scotland to look at how climate related can impact on storm petrel breeding success. Results from this research will give an indication of likely impacts on the SW's breeding storm petrels on the Isles of Scilly (the only breeding site for the species in SW England).

Balearic Shearwater

Climate change may be increasing the occurrence of some species in the South West, such as the Balearic shearwater, which is a globally critically endangered species. This seabird only breeds in the Balearic Islands but, after breeding, migrates through South West England waters between July and October. Since the mid-1990s, there has been a dramatic increase in the numbers of Balearic shearwater in the South West (Wynn and Yesou 2007)

Climate-driven change in prey fish distribution/abundance is likely to be a key driver in this increase, as it correlates with a 0.5°C increase in sea surface temperature (although other factors, such a reduction of available by-catch in the Bay of Biscay, are also important). Increased incidence of mid-winter sightings since 2003 also point to further changes in prey fish distribution and abundance Wynn and Yesou 2007, www.seawatch-sw.org). For instance, anchovy and sardine populations are moving north.

Kittiwake

Monitoring of kittiwake breeding success at a number of sites in the South West over recent years is showing worrying results. Although there is currently no information on food availability specifically for the South west, the breeding success of kittiwakes on the Isle of May has found to be related to sandeel abundance (Frederiksen et al 2006). This may be an explanation for the falling numbers in the South West too, although it is possible that recent unsettled summers leading to weak frontal development and a lack of food at the surface may also be affecting this surface-feeding species.

There is evidence that seabirds in the North Sea have been feeding on Snake Pipefish. This is further evidence that their preferred food is lacking and is problematic because pipefish are poor in nutritional quality, as they are low lipid, bony and difficult to digest.

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Helping seabirds to adapt

The new Marine Protected Areas network (SAC, SPA, MCZ) which is required to be in place by 2012, may help the situation for seabirds, as it is important that the network will:

- Assist functioning marine ecosystems and protect foraging areas for large fauna, including seabirds
- Protect the largest sink for carbon via marine primary production
- Help protect ecosystems, enabling them to recover more easily from climatic disturbances

Contact:

Helen Booker

helen.booker@rspb.org.uk

Relevant links:

www.rspb.org.uk/climate/wildlife/seabirds/index.asp

References

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