

Links between climate change and the fuel loads of migrating Storm petrels *Hydrobates pelagicus*

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We describe large between-year fluctuations in the level of body reserves carried by the smallest Atlantic seabird, the European Storm Petrel *Hydrobates pelagicus* during their northward migration past the coast of SW Portugal. The pattern of body mass variation over the 17-year study period (1990-2006) follows a smooth oscillation. These oscillations are not artefacts of differences between years in the distribution of capture effort, body size, sex ratio changes, etc. Multivariate analyses reveal sea surface temperature (SST) along the migration route to be the prime factor associated with between-year changes in body reserves. SST is itself influenced by a suite of climatic and oceanographic processes, including the North Atlantic Oscillation (NAO) the latitude of the Gulf Stream, and recent air temperatures. Furthermore, it is not SST during the time of migration past Portugal (June) that best explains the level of body reserves, but sea temperatures in the months beforehand. At this time, the Storm Petrels themselves are still many hundreds of miles to the south, but primary and secondary productivity in east Atlantic waters is reaching its peak. This time-delay in the relationship suggests that the link between SST and body reserves is not due to a direct thermal effect, but is likely to be mediated by the climate-driven effects of SST on marine productivity, and hence on food supply of Storm Petrels during migration. Our current research aims to determine the diet of storm petrels during their long distance migrations, in order to understand these relationships in more detail.