

Session 10: Climate Change

Date: Thursday 2 November, 2017
Time: 14:35 – 14:55
Room: Seminar Room

Do responses to temperature vary spatially in the great tit (*Parus major*)?

Presenting author: **Liam D. Bailey**

Authors: **Liam D. Bailey¹, Martijn van de Pol¹, Marcel E. Visser¹**

Affiliations: ¹Department of Animal Ecology, Netherlands Institute of Ecology, Wageningen, The Netherlands

Phenological shifts in response to increasing global temperatures are well documented in a range of plant and animal species, with potential consequences for individual fitness. The hole-nesting great tit (*Parus major*) is a particularly well documented example, where timing of egg laying is important to allow synchronisation between offspring development and local food peaks. Previous studies have demonstrated that temperature affects breeding phenology in great tits, but it is not immediately clear whether all populations are sensitive to the same temperature window. Furthermore, it is unclear whether the strength of such responses are uniform across the species' range as other factors may mediate the relationship between phenology and temperature. For example, it is hypothesised that photoperiod will be a more relevant driver of lay date at higher latitudes.

We present an ongoing collaborative study involving an inter-population comparison of laying date responses to temperature. The great tit represents one of the best study species for this topic, with an extensive network of monitored populations. In each population, we use a newly developed method to determine the window at which temperature most strongly influences laying date. We then determine the strength of the relationship between temperature and phenology for each population and test for spatial patterns across the species' range. We will test how other variables, such as photoperiod and habitat type, help explain spatial patterns in temperature sensitivity. In this presentation, we discuss preliminary results and outline our future research goals.

Differences in temperature sensitivity across great tit populations of Europe may lead to varying levels of phenological mismatch between offspring development and food peaks. Studying how temperature sensitivity of laying date varies across the species' range will give us a better understanding of how different populations may be affected by ongoing global climate change.