



Project acronym: MISMATCH

Project title: Will spatiotemporal heterogeneity in arthropods buffer effects of phenological mismatches on growth and survival in insectivorous Arctic birds?

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Discipline: Earth Sciences & Environment: Ecosystems & Biodiversity

Station(s): Zackenberg Research Station (Greenland/Denmark)

One of the most profound ecological consequences of ongoing climate change is the temporal uncoupling of trophic interactions. Phenological asynchrony between (avian) predators and their prey can result in hampered offspring growth and lower fledging success of the predators. The extent of environmental warming in the High Arctic is unrivalled compared to other parts of the world. Millions of long-distance migrating Arctic-breeding shorebirds are expected to suffer from phenological mismatches with their arthropod prey if they do not adapt, possibly resulting in population declines. Long-term data from the Arctic are, however, rare and current knowledge is merely based on indirect indices or assumptions about (the extent) of phenological mismatch. The mechanisms behind, variation in, and adaptability of birds to adapt to advancing food peaks are, in general, and certainly in Arctic-breeding insectivorous birds, understudied. We propose to study the reproductive timing of an arctic shorebird in relation to arthropod abundance at two sites in Greenland (Zackenberg and Hochstetter Forland) which are strongly suspected to differ in phenology. Within both sites we will track shorebird families to discover whether spatiotemporal heterogeneity of arthropod abundance enables them to avoid negative consequences of late reproduction relative to the overall food peak. DNA barcoding of faecal samples will show prey preferences and if/how that differs between sites and with reproductive timing. Precise measurements of daily chick survival, local monitoring of the breeding pairs and detailed data on juvenile proportions in the wintering area will for the first time allow us to estimate the survival of post-fledging juveniles.