

## **SPRING MIGRATION TIMING OF BIRDS IN THE NORTHERN PRAIRIE REGION IS CORRELATED WITH LOCAL CLIMATE CHANGE**

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### ABSTRACT

Earlier arrival dates of migratory birds at stopover sites and on breeding grounds, correlated with periods of global warming, have been documented for many migrant birds worldwide, but such changes do not occur universally. Migration timing is also often correlated with temperature, so local variation in climate change could produce different effects on migration phenology in different geographic regions. We examined trends in first spring arrival dates (FAD) for 44 species of common migrant birds in South Dakota (1971-2006) and Minnesota (1965-2005) using observation data compiled by South Dakota and Minnesota Ornithologists' Unions. Significant trends in FAD with year occurred for 20 species in South Dakota and 16 species in Minnesota. Of these species, 10 showed similar significant trends for both states and all of these species exhibited significantly earlier arrival and were early spring migrants. Early-migrating species associated with aquatic habitats were most likely to demonstrate earlier arrival, but the few grassland species in the study showed similar trends. When we tested for correlations between mean winter and spring temperatures and FAD, 18 species showed significant negative correlations with either winter or spring temperatures in one or both states. Interestingly, spring temperatures in both South Dakota and Minnesota did not show significant warming from 1971-2006, but winter temperatures in both states warmed significantly over the same period. This suggests that the warmer winters disproportionately affected early spring migrants. The stronger response to climate change by early spring migrants is consistent with data from several other studies, and suggests that migrants are capable of responding to local temperature conditions experienced on wintering grounds or along the migratory route.