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Title: Spring Migration Phenology of Four North American Insectivorous Bird Species in Relation to Climatic Variables

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ABSTRACT

This thesis describes the relationships between the timing of spring migration (phenology) of four bird species and eight environmental variables which could influence migration. Different bird species respond differently to various cues, and research in this area has shown a wide range of results. Some species respond strongly to weather (often shorter distance migrants) while others do not (often longer distance migrants). If environmental conditions continue to change as recently observed, bird species may respond in different ways, potentially leading to ecological mismatches. Approximately 2,000 total records of First Arrival Date observations from 1899 to 1962 were included in the analyses. Multiple regression and stepwise regression were conducted to describe relationships between weather and arrival timing. Two species (Bank Swallow, *Riparia riparia*, and Purple Martin, *Progne subis*) responded with no significant influence imposed on arrival timing by weather or climate conditions. This follows expectations due to their long distance migration patterns. The two other species studies did not respond as expected. Tree Swallow (*Tachycineta bicolor*) arrival dates responded to the *El Niño* Southern Oscillation Index in each of the tests conducted. Barn Swallow (*Hirundo rustica*), a mid- to long-distance migrant was unexpectedly the most responsive to weather and climate.