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Exploring Drought Effects on Barn Swallow (Hirundo rustica) Observation Densities in the American Southwest: The Integration of Citizen Science Data into Applied Geography.

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Environmental shifts caused by climate change are a major factor in the decline of bird species globally; since the 1970's, close to 3.0 billion birds (~29%) have been lost in North America. Barn swallows' niche nesting strategy makes them particularly vulnerable to climate change impacts such as drought. This study seeks to understand the connection between drought the observation density of Barn swallows in five regions, with delineation towards urbanity and rurality, in the Southwestern United States. The development of an anthropogenic mega-drought in the American Southwest will have continue to reap havoc on ecological systems and provides an opportunity for development of applied geographic approaches with citizen science data to detect and understand systemic stressors. This paper explores the impacts of drought on selected barn swallow observation density, the utilization of citizen science data use developing within applied geography, and the need for further integration of citizen science data analysis into applied geography. Pearson's correlation coefficient was calculated for each observation density dataset. Data analysis showed varying degrees of positive correlation between drought severity and observation density across all study areas. In general, observation density tended to be more correlated with drought severity in urbanity than in rurality. The results of this study confirm existing small-scale ornithological sampling for drought influence on barn swallow populations. This paper seeks to explore the difficulties for integration of citizen science data into applied geographic thought and the utilizations within the field.

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