# Ecological causes and consequences of Common Tern aggression

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Seabird colonies consist of thousands of individuals nesting over a large area. Colony aggression is a common social behavior among seabirds as a response to predators, competition for resources, and mating. However, with the growing concern of climate change, ecological factors may change the dynamics of colony aggression. This project studies the Common Tern, a migratory seabird that has a broad range of habitats across Europe, North America, and Asia. Like other seabirds, the Common Tern also exhibits aggression due to the previously mentioned reasons. By better understanding the relationship between ecological factors, colony behavior, and Common Tern aggression, we can improve conservation efforts.

The dataset consists of spatial and temporal datapoints of observed aggression which is further weighted by intensity. A generalized random model (GAM) including smooth terms for space and time as well as their interaction was fitted to model the non-linear patterns in aggression. Furthermore, one interesting preliminary finding that was observed was the relationship between aggression and distance from the edge of the colony and how the estimates change over time given distance. One concern arises with the model predictions breaking down in nests far from the center of the colony, where aggression is expected to be rarer. This could be due to the smoothing methods used and the widening of the adaptive bandwidth far from the center exaggerating the influence of aggressive events in these areas. We will attempt to find explanations for this pattern, whether it is due to the aforementioned methods or perhaps another cause. Thus, we aim to answer how we can deal with outliers and assess the validity of their assumptions of their data. We also discuss best practices in regard to reporting and interpreting the results of the GAM , such as interpreting the parameter estimates, the curvature, and the concavity of the function and how it applies to the ecological context.