Developing an interactive application to analyze detections of nanotagged birds using R Shiny

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The USA’s first offshore wind turbines have been in operation since early 2017, near Block Island, Rhode Island, yet, to date, no studies have published their effects on local wildlife populations. We analyzed nanotag detection data from before and after turbine construction for Common (Sterna hirundo) and federally endangered Roseate Terns (Sterna dougallii) (Gochfeld, Burger, & Nisbet, 2014). These species breed in New York and Massachusetts, prior to migrating to South America (Nisbet, Arnold, Oswald, Pyle, & Patten, 2017). The aim was to develop an interactive R Shiny application that visualizes summer 2016 (pre-construction) Block Island tower tern detections and corresponding weather data. R Shiny allows users to access plots derived from large data sets, for the purpose of isolating and magnifying different variables. The second objective involved Block Island fieldwork to gather further tern detection data for summer 2017 (post-construction), map those detections in R Shiny, and compare the patterns in pre-construction and post-construction data.

We focused on the effects of certain weather variables on tern occurrence and found that detections increased significantly with wind speed, visibility, and tidal height. In addition, detections decreased as precipitation increased. This information will be used by study partners (including the Bureau of Ocean Energy Management and the U.S. Fish and Wildlife Service) to assess risk of offshore wind turbines to Common Terns and federally endangered Roseate Terns.

Sources:
