CONSERVATION IN ACTION:

"The Best Darn Bird Map" A Risk Assessment for Offshore Energy Development

Extreme values and zeros: that's what might stand out to an ecologist looking at historic seabird data from the U.S. Geological Survey's Atlantic Seabird Compendium.

ROSEATE TERNS.
(JORGE SALIVA/US FISH AND WILDLIFE SERVICE)

These values reflect the experience of surveyors looking for birds in a vast portion of the Atlantic Ocean. "There's a lot of difference in the sizes of the groups that are out there," explained Dr. Beth Gardner, Professor of Quantitative Wildlife Biology at North Carolina State University. Take common eider, for example. Although it's typical to see these birds in groups of a few hundred, flocks of more than 50,000 have been recorded as well.

But while extreme values are consistent with what is known about seabirds, they are also are an indication of how much still remains unknown about these species. Although a tremendous amount of information has been collected on seabirds over the past century, it is difficult to interpret or draw conclusions from the data for a number of reasons: The challenge of obtaining accurate counts at sea, conflicting sampling priorities, inconsistent data collection methodologies, and the sheer expanse of the offshore waters, to name a few.

"The question is: can we account for those kinds of values?" asked Gardner, explaining, "The main thing to know is the probability of extremes - what predicts them - but that's hard because it varies species by species."

For marine bird researchers and marine spatial planners, that has made determining risks to species like roseate terns, northern gannets, and common eider a major challenge. With the growing emphasis on offshore energy development along the coastlines of New England and the Mid-Atlantic states, the challenge is becoming increasingly urgent.

Fortunately, for a quantitative ecologist like Gardner, those outliers in the seabird compendium contain valuable information, and a motivating question: "How can we model those extreme historic values to show hotspots for marine birds today?"

That was the objective of the Marine Bird Mapping and Risk Assessment Project - a partnership of federal, private and university partners, like Gardner, who set out to make the "best darn bird map" possible to advance understanding about how marine birds use offshore waters.

It was an effort of unprecedented magnitude. Although numerous projects have gathered information to help identify key habitat for marine birds, each has focused on a different region, and used different technology to gather data.

The final report, methods, and maps from the Marine Bird Mapping project will soon be available on the North Atlantic LCC web page as a resource for practitioners, and a risk assessment tool for siting offshore energy activities.

"So if someone is planning to build an offshore wind farm, the goal is for this map to serve as a guide," said Gardner. It does so by giving decision makers a means of answering a critical question about the proposed sites: What species of birds are likely to be present, and in what numbers? That information can serve as a starting point in understanding whether the proposed wind farm could have negative impacts on seabirds.

Although Gardner's role in the project involved the likes of comparing pareto and negative binomial distributions, and incorporating bathymetric spatial correlates and sea surface temperature into spatial models, she said she was mindful about producing a tool that would be understandable and useful for people of varying backgrounds.

"If you are statistician, the data might mean one thing, but what about for a manager?" she said. "We were very focused on applicability, readability, and clarity when using language that might be confusing."

In the context of marine spatial planning, the project offers something for everyone: The maps offer a clear visual reference, the report provides a framework for decision support, and the methods offer detailed information on model selection that could be useful for scientists.