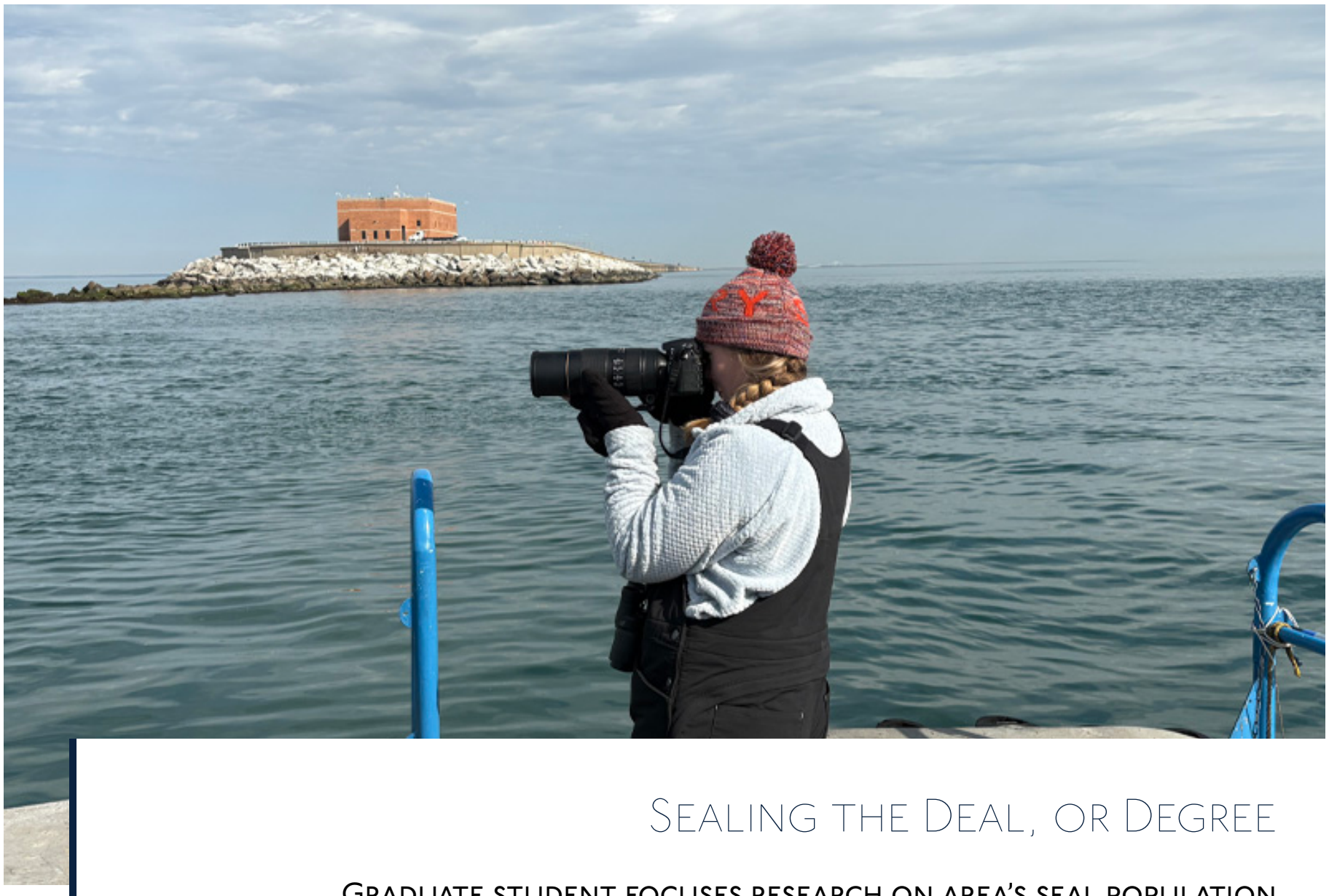

Sealing the Deal, or Degree

Graduate student focuses research on area's seal population

by Kelli Caplan | September 11, 2025

Read time: about 2 min

Seals are not only cute and engaging, but they also played a key role in helping Michelle Guins earn her Master of Environmental Science.

Guins' primary research during her time as a graduate Captain was focused on harbor seals and why so many of the bouncy sea creatures are finding their way to Hampton Roads beaches. As an intern with the Navy Marine Resources Group at NAVFAC Atlantic, she took a deep dive into the seals' seasonal migration patterns.

What she discovered surprised her in a positive way.

Photograph was taken on the Eastern Shore of Virginia using Stealth Trail cameras under the NMFS General Authorization Permit #25811.

"I actually was not even aware we had seals in Virginia until coming across this internship posting," said Guins '25. "The fact that this area draws seals shows that it provides favorable habitat for an even more diverse array of species than people previously thought. Harbor seals are considered an important indicator of ocean health, so seeing them is a good thing!"

Her research uncovered a little known fact: seals, which usually are found in colder waters up the East Coast, are making Virginia home more frequently than they ever have.

“”My thesis was to further investigate the specifics regarding the seasonal migration that is being observed by the seals,” she said.

And what she found was that the seals’ are likely venturing south because of climate change. Warming waters in Maine and Canada may be pushing seals south.

“Harbor seals have strict thermodynamic tolerances, and any deviation beyond those thresholds can have severe consequences for the individuals,” Guins said. “Specifically, pups are much more sensitive to higher temperatures than adults, so if pupping grounds (in Maine and Canada) are warming, they may no longer be suitable for pup survival. In such cases, adults would likely relocate to cooler areas to ensure the survival of their offspring.”

Guins, who graduated from Virginia Tech in 2022, began her research as an intern with the Navy Marine Resources Group, which is the only seal researching effort underway in Virginia. The Navy’s goal was to observe seals hauled out (laying on the land) during the winter on the rocky islands of the Chesapeake Bay Bridge Tunnel and along the marshy beaches of the Eastern Shore, both of which sit close to Navy installations and in heavily traveled waters.

“As I worked with these projects, I developed my own questions about what was going on with the seals. The idea to investigate the night activity came from results of the Seal Tagging and Tracking Project with the Navy,” Guins said.

Guins decided to not only study the seals at her job, but to continue the research in graduate school. She looked at various programs, but was impressed by what was offered through Christopher Newport master’s in environmental science.

“I was introduced to Dr. Rick Sherwin, who had previously advised a student doing seal research in Alaska. After meeting with Dr. Sherwin, the program seemed like a good fit to me, and it was a go!,” she said.

As Guins furthered her research, she decided to morph it into her thesis.

She determined that seals becoming more common in Hampton Roads is likely a trend that will continue.

“The seasonal migration of harbor seals to the Mid-Atlantic appears to not be an anomaly, but rather an emerging and consistent aspect of their ecology- further emphasizing the importance of studying this behavior in greater depth,” Guins said.

The findings even stunned Sherwin, a veteran environmental scientist and professor in the Department of Organismal and Environmental Biology.

“I was very surprised to learn that harbor seals were historically absent from the area and this is a ‘modern’ change in their distribution, not them refilling historical parts of their ranges from which they were displaced. Virginia waters (even in the winter) just seem too warm and the water too murky to support a species that is more typically found in cold, clear waters,” he said.

The research, Sherwin said, is not only impressive, but important in terms of bringing into focus the real-time ramifications of climate change on animals and their environments.

“Michelle’s research is significant and she has already published a peer reviewed paper from her research and presented her findings at eight professional scientific meetings,” he said. “Her research has enhanced our program while bringing her excellent work to the attention of scientists and research managers across the country. Her research and earned MS degree will help her establish herself in a career and profession that will be personally rewarding and have a positive conservation impact.”