

COA PERSPE



Nancy Jackson, a professor of coastal geomorphology in the Department of Chemistry and Environmental Science, has studied beaches and dunes at various global locations, including at this coastal dune system in Brazil.

STAIL C T I V E S

**Studying Forces That
Affect Life Where Land
and Water Meet**



*Land lies in water; it is shadowed green.
Shadows, or are they shallows, at its edges showing
the line of long sea-weeded ledges where weeds
hang to the simple blue from green.
Or does the land lean down to lift the sea from under,
drawing it unperturbed around itself?
Along the fine tan sandy shelf is the land tugging
at the sea from under?*

- From "The Map" by Elizabeth Bishop



In New Jersey, as in many other places on the globe with extensive coastlines, the complex interaction of natural forces and human activity has a profound effect on the quality of life. At a very basic level, for example, the processes underlying the formation of sand dunes determine how protected humans are from storm-driven waves and wind.

Over the course of an academic career that began at NJIT in 1992, Nancy Jackson, a professor in the Department of Chemistry and Environmental Science, has studied coastal environments as a specialist in geomorphology. While much of her work has focused on coastal New Jersey and the Delaware Bay area, it has also been geographically wide-ranging, taking her to locations as far afield as Europe and South America. In Europe, along with studying relevant natural processes, she has investigated how human activities such as agriculture and mining have influenced coastal features over more than two thousand years.

Jackson's expertise in coastal geomorphology, including

sediment transport, has been widely recognized. In 2015, she was named a fellow of the American Association for the Advancement of Science. She is also a fellow of the Geological Society of America and a Fulbright Scholar with international appointments at the Polytechnic University of Turin and the University of Ferrara in Italy.

At NJIT, Jackson has been honored for excellence in service to undergraduate education. Funding for her research has come from sources such as the National Geographic Society, National Parks Service, National Science Foundation and the National Oceanic and Atmospheric Administration.

MAKING THINGS BETTER

Growing up in New England, Jackson spent summers with her family on Cape Cod. She says that this time near the ocean and bordering dunes fostered an interest in nature and the global environment that influenced her decision to major in geography at Clark University.

Jackson relates that her student experience at Clark was also very formative with respect to her thinking about the purpose of education — and science. “I feel that it’s essential to apply what you learn out in the world to make things a little better. I do a lot of applied research, a lot of practical science. When I think about my work, about practicing science, I think about it in terms of how we can answer questions that will improve things down the road.”

After completing her undergraduate degree at Clark, Jackson did not embark immediately on the graduate study that would lead to joining the NJIT faculty and research into the processes that give rise to coastal features. For some 10 years, she was affiliated with nonprofit organizations, including one she co-founded, that helped low-income rural communities in New England build water and sewage facilities, and which focused on groundwater quality management.

To learn more about water issues, Jackson complemented this work with a master’s

from Antioch University in environmental science and management, and subsequently made the life decision to engage with environmental questions and challenges on a different level. It was a decision that brought her to the Geography Department at Rutgers University for a Ph.D. Specializing in geomorphology, she wrote her dissertation on beach dynamics in Delaware Bay.

ASSESSING EVERYDAY IMPLICATIONS

Wanting to stay on the East Coast, Jackson applied for a position at NJIT very compatible with her interests, an opening in what was then the Department of Social Science and Policy in the College of Science and Liberal Arts. Eventually, her expertise led to the appointment she now has in the Department of Chemistry and Environmental Science.

Jackson currently has funding under a Sea Grant from the National Oceanic and Atmospheric Administration to evaluate dune-building processes and the protection that dunes

provide, including protection against extreme weather events such as Hurricane Sandy. “Coastal dunes are one of our state’s most important economic resources, with major everyday implications for protection from flooding and erosion,” she says.

“The ideal is to support the natural processes that underlie coastal dune building. But a critical question is the time frame. Does the natural system have the ability to create adequately protective dunes within an acceptable amount of time? And how do our modification efforts affect the natural processes in play over the long term, for better or worse. There’s a lot we don’t know.”

TOUGH QUESTIONS

Asked about her thoughts on the much-discussed topic of climate change, Jackson says that it’s not an immediately significant factor in her dune research. That’s because she studies processes that alter coastal features over short periods of time compared to the longer-term effects attributable to climate trends, specifically global

warming. “But there’s no doubt that over time changes in climate impact the pieces of shoreline that I look at for my research,” she adds.

And Jackson responds affirmatively when asked if she thinks that an increasing number of people tasked with public-policy decisions are concerned about the impending consequences of climate change. “Concern is definitely gaining traction,” she says. “I don’t see a huge paradigm shift, but it’s clear that awareness of what is likely to happen as a result of climate change is growing incrementally.

“More people are acknowledging that we have very significant challenges ahead of us. They’re asking how soon will we have to act to counter effects such as frequent severe flooding, and what can we do to respond in practical ways, and what will it cost. These are tough questions that will have to be answered.” ■

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