



Outfitted in her native England with red wellies and an oversized umbrella, a young Elinor Martin would one day become one of the nation's most promising researchers on rainfall data.

Rainy Day Woman

OU meteorologist uses National Science Foundation grant to help others succeed.

BY CHIP MINTY

If Elinor Martin were a softball player, she might be regarded among the great utility players of all time. As a shortstop, she would be the player who's always under a fly ball and stops grounders screaming between second and third. As a switch-hitter she would boast a .500 batting average and have pro franchises clamoring for her rare combination of talent. *continued*



Described as “a Major League All-Star” teacher, Martin uses every tool at her fingertips, including recording online videos about climate change in the NextThought studios on OU’s research campus.



But Martin is not an athlete. She’s a scientist who approaches meteorology with the same passion and commitment as any Hall of Famer. And, while some professors find their calling in the classroom and others in the laboratory, Martin loves and excels at both.

As a researcher, she is dedicated to tackling one of meteorology’s most challenging questions – the prediction of rainfall patterns. As an educator, she strives to open the world of weather to her students on their own terms, enhancing understanding and nurturing excitement. When an aspiring student slips through and does not succeed, she remembers them like an infielder remembers an error that leads to a game-winning run.

The National Science Foundation recently recognized Martin for her strengths in teaching and research through its prestigious CAREER Grant, worth nearly \$1 million. The five years of funding will help her pay for the ongoing study of precipitation variability and new research aimed at keeping young meteorology students on a pathway to becoming scientists.

Berrien Moore, dean of OU’s College of Atmospheric and Geological Sciences, recognizes the MVP he has in Martin.

“She came to us, and she has just been stellar,” Moore says. “She got a very large grant that was purely in the research arena to look at precipitation patterns in the United States. She did so well on that, and now she’s hit the CAREER Grant, which is one of NSF’s most prestigious.”

Moore says the NSF announcement last March wasn’t a big surprise to him, however. Her abilities as a researcher were already proven and he’d personally experienced team teaching with her.

“I will tell you, I’m a good teacher, but she put me to shame.

I was in Double A and she’s a Major League All-Star,” Moore says. “I knew she was a good teacher, but until you get into a class with her and you give a class one day, then she gives the class the next day. It was pretty painful.

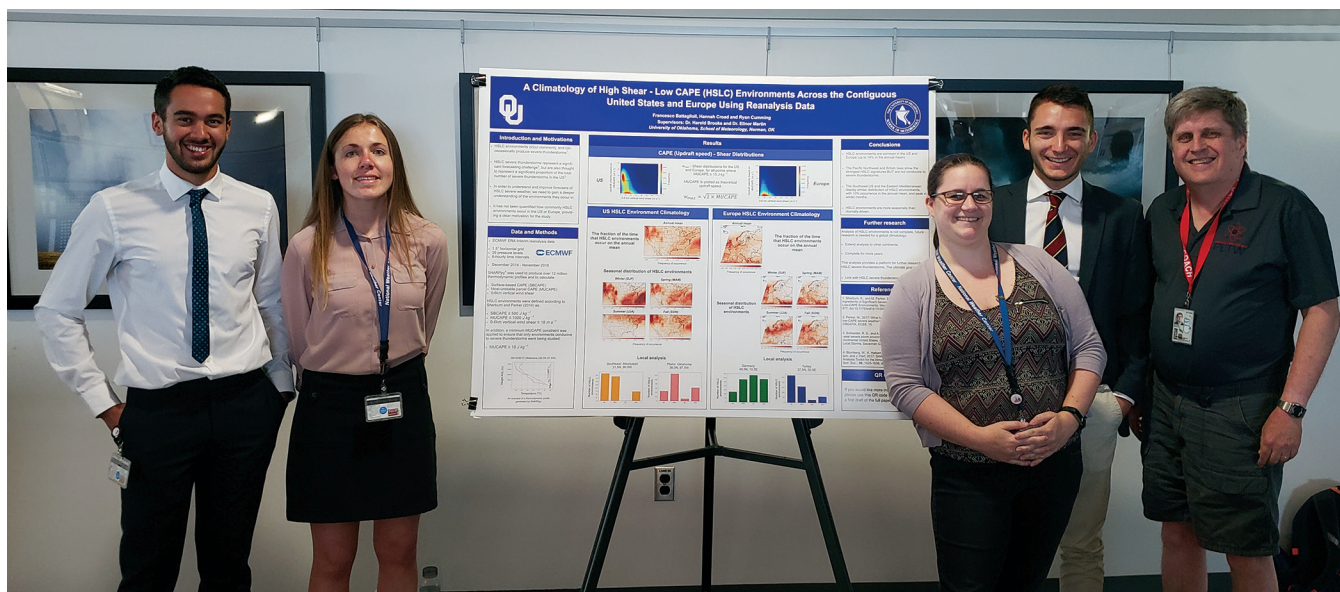
“She makes the subject matter come to life with her illustrations,” Moore says. “She does it in an interactive way. She gets the students engaged. I try to be animated, but Elinor has them up and moving around, talking, asking questions, interacting with one another so students are explaining it to the other students. And I told her at the time, ‘I don’t like this. This is not fun for me to just get blown up every week.’”

Born and raised in England, Martin first came to OU as an undergraduate in a study abroad program. Upon earning a bachelor of science degree in 2005 from the University of Reading in England, she went on to earn her master’s degree from Colorado State University and her Ph.D. from Texas A&M University. After completing a post-doctoral program at State University of New York in Albany, she returned to Norman in 2014 to join OU’s faculty.

Now an assistant professor of meteorology and associate director for undergraduate studies, Martin says she loves people as much as she loves meteorology and she wants to use her CAREER Grant to help make meteorology more accessible to students from different backgrounds.

Like most professors, she’s focused on the students who are in front of her. But the thing that makes her unique is her regard for meteorology students who give up and move on to other fields.

“OU is very well known, so we get a lot of students who



Martin (third from left) and Adjunct Professor of Meteorology Harold Brooks (far right) with exchange students (from left) Francesco Battaglioli, Hannah Croad and Ryan Cumming, who came to OU from the University of Reading and relied on Martin and Brooks as capstone course advisers.

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want to come here, and we get a lot of freshmen, but we sometimes lose students between their freshman and senior year. So, one of the reasons potentially is that we just don’t really portray what being an atmospheric scientist is for those students,” Martin says. “Especially in under-represented groups, we have a lot of students who leave that are really great students. They’re getting A’s and B’s in their math classes, but they change majors.”

Meteorology is not a diverse field, Martin says. Most of the faculty is made up of older, white men and that’s intimidating. Some students fail to connect, and they leave meteorology because they can’t see themselves as a scientist. They may not be aware of anyone in the field with their backgrounds, their race, their ethnicity, or from a town that’s the size of theirs. They may struggle with a class and drop because they doubt their academic ability.

Martin is using a portion of her CAREER Grant to address that problem through an idea she’s borrowing from a similar program used in biology classrooms at other universities.

Through her program, Martin hopes students can develop a “Science Identity” that will allow them to relate personally to science and envision themselves as meteorologists. If her work is successful, she will share it with other meteorology schools across the country.

High school students who visit campus and freshmen enrolled in OU’s School of Meteorology this fall will get behind-the-scenes stories and videos about various meteorologists with a wide range of backgrounds. Students will see an authentic image of who scientists are, learn about their successes and failures, and potentially discover common ground, she says.

Students will also experience meteorology research firsthand, using rainfall data to make graphs, plots and images. They will learn to use coding skills to explore data and find answers to a range of questions, such as, “Was it raining the day I was born?” Through coding, they can also determine the annual rainfall where they grew up and how that might have changed over time.

Martin says her data offers an avenue for students to engage with the science of meteorology and computer coding, which is a big part of STEM and the meteorology degree.

“It’s a bit more of a realistic view of what atmospheric science and meteorology is,” Martin says. “It’s not storm chasing every day. We’re hoping it helps them start to connect with the science, show them what it’s really like. It’s a tool that’s worked in other areas, so I thought, ‘Let’s give it a go.’ I think it could be successful.”

Dean Moore says Martin is committed to awakening students and giving them the confidence they need to be successful.

“We get a lot of kids who want to do meteorology. They’ve been fascinated by the weather, and they’ve grown up in a



The NSF CAREER Grant for teaching and research will allow Martin – seen here leading a 2018 workshop on extended extreme-precipitation events – to continue her study of precipitation variability and make meteorology more accessible to students from different backgrounds.

small town in Texas or Oklahoma or some small Midwestern community. Perhaps they didn't find the right mentor in high school, that role model who steps in and connects."

That can be a barrier, but OU's young professors in meteorology are working hard to make those connections and help kids realize, "I can do this," says Moore.

"I'm really watching a lot of our young faculty, and they don't teach by intimidation," he says. "They don't teach you by just lecturing, and 'the student can either get it or not.' There's a real commitment and Martin is the leader in that. I can see that her commitment to teaching and her innovation is rubbing off. As a consequence, all of our young faculty are much better in the classroom than the rest of us. And that's a fact. I am constantly learning from her, and even I will get better!"

As Martin moves forward with her Science Identity program, she's also carrying on with her research into what causes changes in the annual rainfall cycle, hoping to improve long-term rainfall predictions. Improved forecasting in this area could help everything from water resource-management to agriculture, she says.


Right now, farmers don't have much warning when heavy spring rains begin in April instead of May, or if spring weather turns out to be unusually dry or wet. She says meteorologists are good at forecasting one day or one week in advance, but they are not very good at providing much lead time.

"If we could tell people, 'Hey, the rain is going to start later this year,' and we could give them some warning on that more than a day, or more than a week, then it could help with planning, especially in a lot of these water resource-management communities," Martin says. "What I'm planning to do with my research is to really understand how these things have changed historically and look at what factors are controlling them."

If her research can uncover more about the processes that are happening in the atmosphere, forecasters may be able to predict events better and help people who need that information.

Martin says she enjoys research and teaching. But she says meteorology as a science would be stronger if it were more diverse with people of different backgrounds, so she is excited to use her grant to bring a more diverse range of people into the field.

"I want to give people the chance that I got. I had some really good opportunities when I was younger, and I had some really good role models and female scientists, and now I see a lot of people don't get that. Through this grant, I can try and give that to people."

If she is successful, Martin will be batting a thousand. 

Chip Minty is a Norman-based writer and the principal of Minty Communications, LLC.