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Grad Slam winner Annette Hilton wants to use data to keep tap water flowing

Her [LinkedIn](#) profile says she's "a human being who enjoys tea, water research, community, writing and a thousand other things," and now [Annette Hilton](#), a doctoral student at UC Santa Barbara's Bren School of Environmental Science & Management, can also say, Grad! Slam! Winner!

Hilton took top honors in the campus's 10th annual [Grad Slam Showcase](#), which features graduate students from all fields as they compete in the art of the three-minute research talk. Now she will take her talk to the next level, competing at the [UC-system wide competition](#), emceed by UC President Michael Drake, at LinkedIn's headquarters in San Francisco.

For her first place finish, Hilton explained how her hydrology research aimed to use historical measurements on groundwater to inform decisions that could help keep the water we drink clean and flowing — about 50% of the tap water in the U.S. comes from underground. Records on groundwater only go back as far as the 1940s but by then, groundwater had been tapped for at least 70 years for all kinds of uses, including industrial, agricultural and human consumption. Importantly, groundwater also sustains natural habitats.

"How can we manage groundwater if we don't know what it was like before we started using it?" Hilton asked in her [3-minute talk live on stage at Campbell Hall](#). To

reconstruct groundwater measurements from the late 1800s and early 1900s, she looked to out-of-print U.S. Geological Surveys. Over six months, she led a team of five student researchers to hand transcribe and digitize nearly 10,000 early groundwater measurements.

As it turns out, Hilton discovered, in the late 1800s, groundwater frequently gushed out of wells and onto the surface, like a fountain, and often in places where today wells are going dry. In her data, Hilton observed a drop in flowing wells from 61% in 1910 to only 5% in 2010. In addition to meeting human and animal needs, a healthy groundwater supply also keeps the earth from sinking and lowers the impacts of contamination.

“Using historical measurements, we can make decisions to protect the water that comes out of the tap in the future,” Hilton, who also has a background in theater, said in wrapping up her 180-second, jam-packed presentation.

“This year’s Grad Slam final round showcased the amazing research that graduate students pursue across campus,” said Baron Haber, assistant director of professional development for Graduate Division. “It was a competitive field and Annette quite deservedly rose to the top. Her three-minute research presentation analyzing groundwater records shows how relevant historical research can be for the problems we face today, and her warm public-speaking style made a complex topic accessible and engaging for all.”

As the UCSB champion, Hilton won \$2,000, and she’s not the only one who walked off the stage with money in her pockets. The panel of judges also selected runner-ups Abdullah Salehuddin and Samantha Fiallo, who each received \$1,000. The audience selected the People’s Choice winner Fabio Ricci for the \$500 prize.

Salehuddin, a doctoral student in the Department of Communication, researches effective forms of communication, especially during conflict, in the hopes of helping others sustain more meaningful relationships. In a pre-interview aired at the event, Salehuddin said that he is “an undocumented, first generation and previously homeless graduate student.” Because of the circumstances which he has endured, he learned to set goals thinking of “prevention” rather than “attainment,” working hard to help prevent future generations from going through what he went through.

Drawn to the kind of research where you observe what is known in search of “uncovering a secret,” Fiallo, a cellular biologist, is looking at why some mitochondria is better than others. “Good mitochondria” is the cell’s powerhouse, a source of energy and essential to human function. “Bad mitochondria,” on the other hand, is vulnerable to diseases and cancers. While earning her doctorate in the Department of Molecular, Cellular and Developmental Biology, Fiallo has been searching the globe for the best mitochondria and comparing how resilient they are. Her research could one day help reduce the risk of mitochondrial diseases.

Using his quarantine home pizza baking skills as inspiration for his talk, mathematician Ricci entertained the audience all the way to the People’s Choice award with one formula and a few geometric examples that showed how elegantly space can be divided. The additional graduate students who made it to the final round were Gil Vitro (English), Anna Alvarez (mechanical engineering), Vaishali Surianarayanan (computer science), Chongzheng Wei (counseling, clinical, & school psychology) and Kseniia Karnaukh (chemistry).

“The nine presenters for this year’s 10th anniversary of Grad Slam hit it out of the metaphorical ballpark,” said Leila Rupp, Interim Anne and Michael Towbes Graduate Dean. “What a dazzling array of research from across campus! The event showcased the brilliance and passion of our graduate students, who make such a difference for our students, faculty researchers and the community.”

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About UC Santa Barbara

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