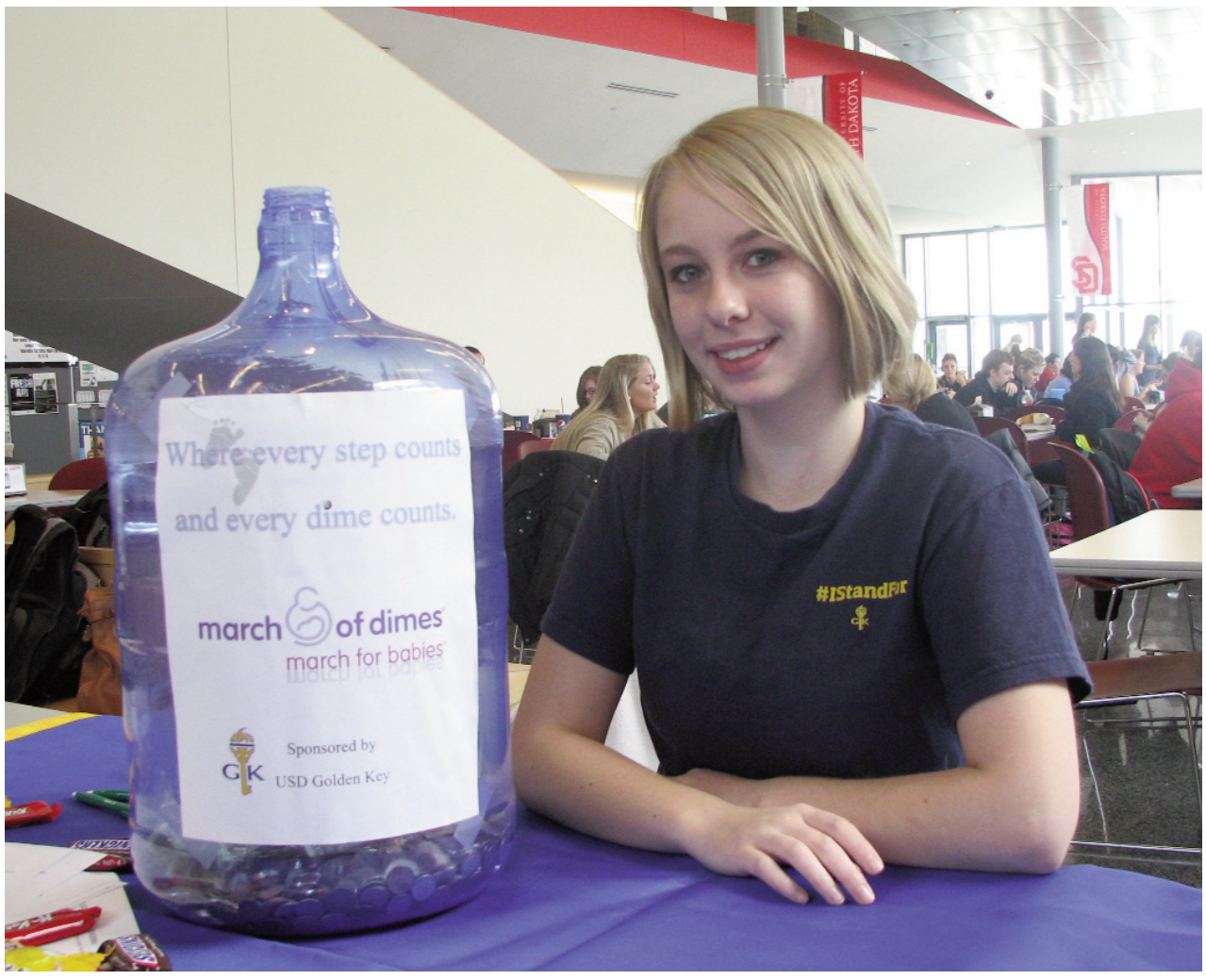
Spotlight On USD

UNIVERSITY OF SOUTH DAKOTA

Golden Key to Participate in March April 27



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Aeolian processes – the ability of the wind to change the surface of the earth – have a potentially large effect on the formation of and changes to sandbars.

This is why USD undergrad Karen Herrig and Dr. Mark Sweeney, associate professor of earth sciences, are studying the effects of the wind on sandbars located in three nearby locations, including Elk Point and Ponca, NE.

Herrig said that when the study is complete, they hope to know how much dust is emitted from the sandbars, how it impacts the air quality on windy days and to determine if there is a potential hazard to wildlife.

"We haven't gotten that far in the study," Herrig said. "I don't know if there's a link at all yet, but eventually we will get there."

Herrig made a presentation on the study during the annual Missouri River Institute Research Symposium, which took place at USD on April 4.

"Rivers are common source of dust, especially on glacial landscapes," Herrig said. "(Transporting the dust) is such an easy thing for the wind to do, and that can change the landscape of the sandbars. We would like to know how much dust is getting emitted off of the sandbars."

To find out, Herrig and Sweney used a Portable in-Situ Wind Erosion Lab (PI-SWIRL), which measures the amount of dust emitted from a surface when a known amount of wind shear is applied.

A flat blade inside the machine rotates at various levels to simulate specific rates of wind, which allows the dust to be measured.

"We went to about four to six different sites on each sandbar, and at each one of those sites we did four tests using the PI-SWERL as a means to judge the emissions potential of the dust on those sandbars," Herrig said.

They also measured on different surface types of each sandbar, including dune, interdune and wind ripple.

Dune is lighter in color and consists mostly of sand, which interdune is darker and made of other materials like gravel, Herrig said.

Aeolian processes are very important to the process of sandbar modification, she said.

"(The wind) can blow off sand on the bar, reducing the height of the bar over time," she said. "(It can also) pick up the sediments and suspend them in the air … and leave the coarser material like gravel behind. So then it makes just a layer over the sediment and reduces how much dust can be emitted because it takes a higher velocity to pick up the gravel."

Debris on the sandbars also play an important role.

"It can affect sediment transport, because the debris slows down the wind velocity, and when the velocity slows down it no longer keeps the sediment in suspension," Herrig said. "Then it just drops out and forms a deposit. So, debris like logs can definitely change the landscape and change how sediment can be transported."

Herrig and Sweney already have performed a particle size analysis of some of their samples at the University of Nebraska-Lincoln, and used X-ray diffraction to determine the composition of some surface samples.

However, she said it will take time for the overall project to be completed.

"This study is a work in progress. It's in the beginning stages," she said. "We'll be doing more this summer."