Cullen College doctoral student Clara Palencia’s knowledge about shale earned her second place in the Ph.D. category in the International Student Society of Petrophysicists and Well Log Analysts (SPWLA) Competition. Palencia studies under the direction of Lori Hathon, Cullen College assistant professor of petroleum engineering.

Hathon and Palencia are using the reconsolidation technique, pioneered in civil engineering for strength testing in soils, to understand the physical properties of mudrocks, a generic term for a class of sedimentary rocks that are comprised predominantly of clay-sized material (less than two microns in diameter). Mudrocks are also known as shale, the organic-rich rock that contains liquid hydrocarbons called shale oil.

The team creates mudrocks in the lab with varying parameters, like different types of clay minerals or different pore fluid salinity. Most importantly they vary the amount of organic content. In this way they can assess how the properties of mudrocks change when they generate hydrocarbons.

"Clara’s work will allow us to better understand the data that we typically measure in drilling wells in terms of the volume of organic material or hydrocarbons in place and how susceptible the formation is to stimulation, like how brittle or how ‘frackable’ it is," said Hathon.

Palencia’s award-winning paper is called “Electrical and acoustic properties evaluation of reconsolidated mudrocks as a function of organic matter content.” It was selected from more than 100 entries around the world.