

# Students use new lab to study how sounds influence human health

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In one of the first studies conducted in the Social Science Acoustics Laboratory, Recreation, Park, and Tourism Management graduate student Lauren Abbott along with Jennifer Newton, doctoral candidate for recreation, park, and tourism management, and Alex Polli, an undergraduate student in psychology, are conducting research to see if natural sounds and manmade noise influence human health. Credit: Kevin Sliman

The Department of Recreation, Park, and Tourism Management at Penn State has established the Social Science Acoustics Lab in Keller Building

at the University Park campus. The lab is used in a variety of ways to investigate the impact natural sounds have on human health.

In one of the first studies conducted in the lab, Lauren Abbott, recreation, park, and tourism management graduate student; along with Lauren Wasmuth, an undergraduate communication sciences and disorders major; and Alex Polli, an undergraduate student in psychology; are conducting research to see if [natural sounds](#) and manmade noise influence [human health](#).

The students hope to determine the relationship between the natural world and human health. People often say they feel rejuvenated after spending time outdoors, and this study investigates that notion.

"If we can show through this lab and other studies that there is a relationship between the natural world and promoting human health, we may be able to show the public that national parks are not only beautiful places to visit, but places where you can come to relieve stress or recover from day to day life," Abbott said.

Roughly 180 students are expected to volunteer.

Participants are first challenged with cognitive tasks, such as numerical memorization, or a "depletion task." Participants are then prompted to look at a video of a park setting projected on a screen and visualize themselves within the scene. The videos are set up to randomly expose participants to video with no audio, video with natural soundscapes, or video with manmade noises, such as motorcycles and propeller planes. Afterward, the participants are given a cognitive test, which is intended to measure how well they recovered from the first "depletion task."

"As someone who grew up loving the outdoors and loving nature, there's something that happens afterward and you just feel rejuvenated," Abbott

said. "Growing up, I didn't know there was this field of study that was looking at the area of human health and nature, but it aligns really well with my own personal interests."



A student who volunteered to participate in a study on how sound affects health watches a serene scene and listens to native sounds found in national parks.

Credit: Kevin Sliman

The laboratory study is innovative in that most research related to nature and health is conducted in the field. A controlled study in a lab can help set the stage for future field studies. The new lab also gives researchers an opportunity to test instruments and gear before taking them into the field.

Jennifer Newton, a doctoral candidate who will use the lab and previously studied visitor experience at Grand Teton National Park, said,

"With these studies we better understand how people travel through space what they think about that space and how that space makes them feel."

Peter Newman, professor and head of Department of Recreation, Park, and Tourism Management, Derrick Taff, assistant professor in the department, and Jake Benfield, psychology professor at Penn State Abington, began looking at natural sounds and cognitive and physiological human responses while working together at Colorado State University. All three faculty members have since joined Penn State.

Once here, a larger plan to study natural sounds began to unfold, which included opening the acoustics lab at Penn State. With support from Social Science Research Institute, a working group for natural sounds and human health formed in January 2014.

The working group also includes Josh Smyth, professor of biobehavioral health and medicine; Vic Sparrow, professor and interim head of the graduate acoustics program; Michelle Vigeante, assistant professor for acoustics; Holly Salazar with the National Park Service; Jonathan Beever with the Rock Ethics Institute; and Kathy Hodgdon with the Applied Research Laboratory.

The purpose of the working group is to bring experts from multiple disciplines to collaborate on a research agenda that helps to inform the effects of anthropogenic noise on the natural world and human health.

"When there is a clap of thunder, vibrations move toward your ear, the ear receives it, and your brain interprets it, and that leads to cognitive and physiological processes," Newman said. "Right here at Penn State we have some of the world's leading experts on every part of this process, from the acoustics and psycho-acoustics, to the psychology and physiology. There are few places in the world that house all of these

experts in one place and only together can we can help to address the complexities and impacts of increasing noise in natural environment."

Provided by Pennsylvania State University

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