STEM STORIES

STEM
University of Northern Iowa

Program Spotlight **December 2018**

THE SWEET SPOT

The University of Northern Iowa is unlike other higher education institutions. It is a small enough school that professors can truly get to know students and help them in their coursework and careers. Yet, it is large enough to be able to provide opportunities such as community engagement, internships, and involving undergraduate students with research on campus. "UNI is in the sweet spot," says Biology professor Dr. Kenneth Elgersma. He continues, "Resources are available to do top-notch research and students have the opportunities to get research experience. UNI does this really well."

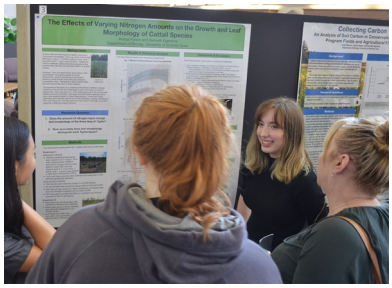
Undergraduate research is valuable to employers. Students are able to develop their skills of logical thinking and problem solving. "This is one of the reasons that I do this. It is valuable to the students and gets them ready for the next step in their careers," Dr. Elgersma shares. Undergraduate research is also essential to continue on to a masters program in most sciences.

Dr. Kenneth Elgersma, REAP mentor, & Anissa Forero, REAP apprentice.

Knowing how valuable opportunities like this are, the United States Army Education and Outreach Office in collaboration with UNI STEM brought the STEM REAP (Research and Engineering Apprenticeship Program) to UNI in 2017. This program focuses on providing opportunities to talented but traditionally underrepresented high school students. The students obtain research experience, receive training, and encouragement to obtain a higher education degree in a STEM field.

Dr. Elgersma was a faculty mentor in the UNI REAP program in the summer of 2017. Anissa Forero from Cedar Falls High School was selected and given the opportunity to work with Dr. Elgersma on his current research. Anissa's tasks involved extracting DNA from native and invasive species of cattails. She then amplified the DNA in a process called *polymerase chain reaction*. Once she had enough DNA, she was able to analyze it. The majority of the cattails that we see in Iowa's wetlands, ditches, and other waterways are invasive species. The invasive cattails are similar in appearance to the native cattails. It is becoming even more challenging to identify these as the cattails create new hybrids. Analyzing DNA is the only definitive way to tell some cattails apart. Once this method is perfected, it may provide an additional tool to help manage wetlands. Anissa's work contributed to solving this challenge.

The largest challenge of the REAP program is time. Many scientific research projects take years to finish, but the REAP program is only eight weeks; not long enough to take a project from start to finish. However, students are able to complete a small study that contributes to a larger project. This is what Dr. Elgersma has done as a mentor. He has found ways to plug students into one if his existing research projects. This particular project is building off of Dr. Elgersma's post-doc research. Anissa's cattail DNA research is part of understanding if and how excess nitrogen in Iowa is affecting and possibly promoting the non-native cattail invasion. Students, like Anissa, may not get to see the beginning or the end of the big project, but they will have contributed a supporting study and will be able to see how it fits into the project as a whole.



Anissa Forero presenting REAP cattail research.

UNI STEM is currently taking applications for the summer 2019 REAP-STEM program. These positions are highly competitive and include a stipend for the student. For more information, visit the UNI STEM website: https://stemed.uni.edu/k12/REAP-STEM. UNI researchers interested in becoming advisors and involve students in their research can contact UNI STEM Coordinator Marcy Seavey.

Story by Ginger L'Heureux, UNI STEM Graduate Assistant, gil@uni.edu