SPRING 2022 | ISSUE 2

TRANSFORMING TOGETHER

The Newsletter of the SIRIUS II Project*

Collecting sediments from the American River for Julie Griffin's Sedimentology and Stratigraphy class.

FINDING INSPIRATION: INTERVIEWS & ALE-APALOOZA

Welcome to the Spring 2022 issue of Transforming Together! We are a year and a half into our timeline for the SIRIUS II project and have some exciting stories and updates to share.

The SIRIUS II project is focused on incorporating authentic learning experiences (ALEs) into college curricula, and several instructors have already begun to implement their ideas. In this issue, we interview five instructors, from five different disciplines, who included an ALE in their Fall 2021 or Spring 2022 classes. We hope that their stories will provide inspiration, as well as opportunities for brainstorming and collaboration, to our faculty learning community. Each piece is a brief overview of an ALE in action, with more details from each interview available on our website at https://www.csus.edu/college/natural-sciences-mathematics/sirius/. These ALEs are unique works in progress, and we are enjoying this chance to see and showcase what people are doing.

In addition, the SIRIUS II team would like to announce our first annual ALE-apalooza! We are excited for this upcoming time to celebrate, reflect, learn, and support each other. In this workshop, we will get to hear directly from instructors who have already implemented their SIRIUS II projects, learn about strategies others outside our network have used, and network with each other. While our first day, May 25th, will be conducted online (synchronous morning and asynchronous afternoon), the group will get to meet in person for the first time on May 26th, and we can't wait. Thank you to everyone who is helping to make the SIRIUS II project a success!

SCIURUS CURIOUS

Susan Ramones, Biology; more details at https://tinyurl.com/ALEsinAction

Whether you love them or loathe them, squirrels (Sciuridae) can be fun to watch. In Fall 2021, students in Susan Ramones' non-majors biology course at American River College learned to observe squirrels like professional field biologists, while still having fun! With help from Squirrel-Net, a national teaching resource and data repository, Ramones designed a three-part authentic learning experience (ALE) in which students independently gathered field data on squirrel behavior, formed and revised hypotheses relating environmental conditions to observed behavior, tested these hypotheses using shared national data from Squirrel-Net and presented their findings in a final write-up. To develop hypotheses, students collaborated in online discussion groups, a tool that had not worked as well pre-ALE. Ramones found that these discussions not only improved students' hypotheses, but also helped build relationships and a sense of community that lasted throughout the semester–an important feature for an asynchronous online course. "The biggest thing they seem to take away from [the ALE] is how important peer review is and how much it helps [them] come up with a better hypothesis." And of course, there is the unbridled joy of watching squirrels: "It's hysterical. And the students love it, like every single student."

The squirrel selfie is a favorite requirement in this class.

BUILDING THE FUTURE THROUGH RESTORATION

Michelle Stevens, Environmental Studies; more details at https://tinyurl.com/ALEsinAction

It is hard to believe that a scenic refuge for turtles and other riparian life lies behind Cal Expo. But this site, Bushy Lake, is also home to an eco-cultural restoration project and provides an outdoor classroom for Michelle Stevens' Restoration Ecology course (environmental studies, Sacramento State). Stevens spearheaded the restoration project in 2015, and students have played an active role in restoration work–preparing, planting, and maintaining a landscape of fire-resistant native plants–and wildlife monitoring, including vulnerable western pond turtles. In June of 2021, a fire ravaged the Bushy Lake site. "It was devastating," Stevens observed, "but then I saw the silver lining." Fire-resilience is one of the overarching ecological goals at Bushy Lake and this unplanned natural experiment is allowing students this spring to study the effects of the fire on plant and animal species. Students indicate that the research-based course is challenging, but they are also excited to experience what restoration work is like first-hand, instead of just reading about it in a book. What motivates Stevens? "Watching the sense of wonder on students' eyes," and seeing them get jobs as field biologists or restoration ecologists.

Students replanting at Bushy Lake after the June 2021 fire.

GOT DATA?

Hello Team SIRIUS II! Do you have datasets that need a home? Project ideas that involve collecting and organizing data? The GIS Data Acquisition and Management class (next page) can help! Please e-mail Anna Klimaszewski-Patterson at anna.kp@csus.edu to start your next collaboration.

DATA MANAGEMENT FOR THE REAL WORLD

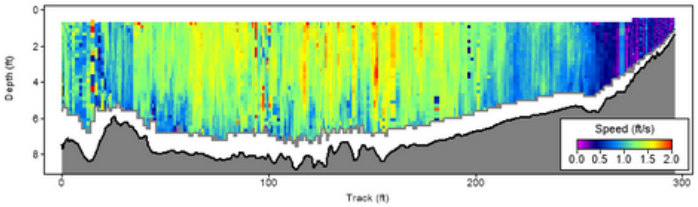
Anna Klimaszewski-Patterson; Geography; more details at https://tinyurl.com/ALEsinAction

Have you ever felt overwhelmed by data? Last fall, Anna Klimaszewski-Patterson (geography, Sacramento State) implemented a new course-GIS Data Acquisition and Management-designed to give students real-world skills for acquiring, organizing, and storing datasets. In addition to giving students experience tackling the types of assignments they will face in the workforce, Klimaszewski-Patterson wants to create a central database that can be used by faculty and students in the SIRIUS II project to store and share data. In the course, students used tools of the trade such as Microsoft Access, ArcGIS Collector, and ArcGIS Survey123 to accomplish tasks like developing folder organization structures and creating data collection forms. Instead of showing students how to get to the end results, Klimaszewski-Patterson presented them with a problem, and they were charged with figuring out how to achieve the solution. Klimaszewski-Patterson explained, "The way that I do labs is, I'm not going to tell you how to do it; this is what I want to have happen. Because that's what you're going to get at work." Students reported that they used what they learned in class each week in their internships, and Klimaszewski-Patterson noted, "They really liked that they were doing something for someone else."

ENGINEERING IN ACTION ALONG THE RIVER

Cristina Poindexter, Civil Engineering; more details at https://tinyurl.com/ALEsinAction

A stretch of the American River near Sacramento State is particularly vulnerable to erosion, and the U.S. Army Corps of Engineers began addressing this issue with levee improvements earlier this spring. Cristina Poindexter (civil engineering, Sacramento State) is using the Corps' bank protection projects as the backdrop for a new authentic learning experience (ALE) in her Hydraulics Laboratory course this semester. Because shear stress can lead to riverbank erosion, the goal of the ALE is to estimate shear stress where the American River flows beneath the Guy West Bridge. Students measured water velocity across the channel beneath the bridge and used the data to calculate shear stress. Because there are various ways to do this analysis, Poindexter has each of four groups analyzing the data in a different way. These data will provide a baseline; future students will be able to see how larger flows and bank protection measures affect results. Poindexter observed that the students seem more motivated: "They know that it's a real problem and we don't know the answer and I like that part of it, I think that's working in terms of it being an ALE."



Water velocity transect generated by Hydraulics Lab students.

A RIVER RUNS THROUGH IT: SEDIMENTATION & COLLABORATION

Julie Griffin, Geology; more details at https://tinyurl.com/ALEsinAction

What can students learn by scooping up river sediments? Julie Griffin (geology, Sacramento State) found out this spring in her Sedimentology and Stratigraphy course. For their authentic learning experience, students used the department's boat, an underwater drone, and a sediment sampler to begin answering two research questions: what is the history of flow velocity in the American River and where are these sediments coming from? Students used the drone to visually assess sediments from shore before collecting samples. To help students think about how sediment size patterns relate to water velocity, Griffin collaborated with fellow SIRIUS II professor, Cristina Poindexter, who provided velocity data collected at the same location by her students. In addition to hands-on skills with authentic research tools, students gained troubleshooting experience. When students' scoops were full of algae and nothing else, Griffin thought, "Okay, this is authentic." They worked together to find a solution, and Griffin indicated, "They did a great job using information that they got from one piece [the drone footage] to help out with the other piece [sample collection]." Students also enjoyed the opportunity to spend time in the field; Griffin observed, "I think they had a good time."

Grab sampler purchased with SIRIUS II funds.