CRUCIAL NEW RESEARCH QUESTIONS RISE FROM WILDFIRE ASHES

Fires commanded headlines and wreaked destruction across California in 2020. Flames devastated the Silverado Canyon area of Orange County, where multiple UCI scientists were conducting research. But from the ashes, UCI School of Biological Sciences experts are already developing vital new lines of inquiry into land conservation, climate change and more. According to the California Department of Forestry and Fire Protection, more than 9,900 fires ravaged over 4.2 million acres of California land in 2020.

BioSci is home to the Center of Environmental Biology (CEB). Its world-renowned faculty tackle questions across disciplines, including genomics, comparative physiology, microbiology and climate change. BioSci scientists have partnered with local institutions such as the Irvine Ranch Conservancy to conduct conservation and restoration efforts throughout the county, including Loma Ridge and Bee Canyon.

The area has a long history of drought and fire damage, leading to the influx of non-native plant species. Before the flames that tore through in October, November and December of 2020, BioSci ecologists and their external collaborators were working on projects introducing native plants to help restore Silverado Canyon.

Following those fires, CEB scientist Dr. Sarah Kimball took a group of students to survey the impact. They found that the restoration sites had more native species diversity after the fires than the control, unrestored and degraded sites. Hopefully, the continued cooperation between university ecologists and local conservationists will mitigate some of the land degradation that future fires may cause.

Dr. Sarah Kimball

BioSci scientists were also using the area to investigate climate change. The fires destroyed research sites for Professors Steven Allison, Jennifer Martiny and Kathleen Treseder, as well as CEB staff Moises Perea-Vega, Julie Coffey and Priscilla Ta. All of them quickly swung into action to move forward from the disaster with new lines of investigation. Along with Dr. Kimball and some exceptional student researchers, the team has begun studying how drought conditions at various sites shaped the fire damage.

Some initial data obtained by CEB researchers suggest that drought sites burned colder than well-watered locations, likely because the dry areas had less fuel to power the flames. This information informs how weather and climate influence fire severity.

With no end in sight to cycles of extreme climate conditions such as drought and fires, future Silverado Canyon research sites will undoubtedly be affected. While restoring plants can offer some protection, BioSci scientists have collected data showing that more frequent fires will hinder those efforts.

Recognizing this challenge, our biologists are adapting their research questions in important and creative ways. However, institutions funding the investigations may not be as fast to catch up, potentially jeopardizing the ability to learn more about this urgent issue facing Orange County, California and the world.