UNIVERSITY OF CALIFORNIA
MERCED

NATURAL RESERVE SYSTEM

Yosemite and Sequoia Field Stations

Year in Review 2021-2022

Half Dome in Winter from Glacier Point. Photo credit: Breezy Jackson

UNIVERSITY OF CALIFORNIA MERCED

NATURAL RESERVE SYSTEM

Table of Contents

About Us

Yosemite Field Station

The Yosemite Field Station is located at 4,000 feet above sea level near the southern boundary of Yosemite National Park in the historic community of Wawona. It is part of the University of California Natural Reserve System and is operated by UC Merced in partnership with the National Park Service. A gateway to one of America's most beloved national parks, the field station offers year-round access to the western slope of the central Sierra Nevada, including Yosemite as well as the Sierra National Forest, for research, education, and public service. The field station is conveniently located within mid-elevation mixed conifer forest along the South Fork of the Merced River within only a few hiking miles of the Mariposa Grove of Giant Sequoias and subalpine and alpine ecosystems. The field station is comprised of an historic office building with four workspaces, a small lab, a conference room that can accommodate 25, and housing for 58 people across 6 cabins including an ADA-accessible cabin. In addition, the historic carriage house was renovated into a state-of-the-art Data Visualization Center with full audio-visual capacity and seating for 45. Our goal at Yosemite Field Station is to sustain a hub of scholarship and collaboration in service of the ecology, biodiversity, and cultural values of the Sierra Nevada.

Sequoia Field Station

Located near the heart of Sequoia National Park, the Sequoia Field Station provides year-round access to the southern Sierra Nevada mixed conifer, subalpine, and alpine ecosystems of Sequoia and Kings Canyon National Parks for research, teaching, and public service. Situated at the edge of Wolverton Meadow and within a mile walk of Giant Forest, the Sequoia Field Station is only two miles from the General Sherman Tree which is the largest tree by volume in the world. The one-room cabin is well-accommodated with a kitchen, bathroom, and sleeping accommodation for three. In addition, visitors can access the "old ski shop" for classes, meetings, or field work preparation.

Autumn light on El Capitan. Photo credit: Breezy Jackson

Our Mission

The mission of the Natural Reserve System is to contribute to the understanding and wise stewardship of the Earth and its natural systems by supporting university-level teaching, research, and public service at protected natural areas throughout California.

Lower Yosemite Falls. Photo credit: Breezy Jackson

People

Our Staff

Dr. Jessica Blois
UC Merced Natural Reserve System Faculty Director

Dr. Jessica Malisch
UC Merced Natural Reserve System Associate Director

Dr. Breezy Jackson
Yosemite and Sequoia Field Stations Director

Marlon Spinneberg
Yosemite and Sequoia Field Stations Steward

Advisory Committee

Dr. Jay Sexton, Chair
Associate Professor, School of Natural Sciences

Dr. Nigel Hatton
Associate Professor, School of Social Science, Humanities, and Art

Dr. Crystal Kolden
Associate Professor, School of Engineering

Dr. Jeffrey Jenkins
Assistant Professor, School of Engineering

From left to right: Marlon Spinneberg, Jessica Blois, Breezy Jackson, Joy Baccei (Merced Vernal Pools and Grassland Reserve Director), and Jessica Malisch.

Visitation Summary

In the 2021-2022 fiscal year, the Yosemite Field Station hosted 391 users for 3,216 user days. User days were almost evenly split between University – Level Research (49%) and Public Service (i.e., “other) (48%). University-Level Courses contributed 96 total user days as we slowly returned to in person instruction due to COVID-19 pandemic restrictions. Use increased by 212% overall compared to FY20-21, 122% compared to FY19-20, but was still reduced by 58% compared to pre-pandemic use (Average of FY16-17 through FY18-19). Despite a reduction in overall use compared to pre-pandemic levels, research use increased 194% compared to pre-pandemic use. We served 7 out of 9 UC campuses with UC user days comprising 37% of all use.

In the 2020-2021 fiscal year, the Sequoia Field Station hosted 30 users for 176 user days. Research use made up the majority of user days (124) and public service use made up the remaining 52 user days. In general University-Level Courses are not held at Sequoia Field Station since the occupancy is limited to three. Use was similar to FY20-21 (six user days different) and increased by 120% compared to FY19-20. Use is still reduced by 62% compared to pre-pandemic use. We served 4 out of 9 UC campuses with UC user days comprising 32% of all use.

Total revenue at Yosemite Field Station was $68,260 in FY 20-21. Revenue fell by 19% compared to FY19-20 ($84,140), and revenue was down 58% compared to the pre-pandemic average (FY18-19, $170,680; FY17-18, $135,980; FY16-17, $178,124). Revenue at Sequoia Field Station was $1,118 in FY20-21 which nearly doubles revenue from FY19-20 ($667) and is 71% of the pre-pandemic average (FY18-19, $1,065; FY17-18, $1,335; FY16-17, $2,302). Revenue loss is primarily due to the COVID-19 pandemic; however we also saw reductions in revenue in FY17-18 due to the Ferguson Fire evacuations.

Fernandez Pass. Photo credit: Breezy Jackson

News

KNP Complex Fire

Following a lightning storm on September 9th, 2021, the Colony and Paradise Fires were identified. These later combined to create the KNP Complex which burned 88,307 acres within Sequoia National Park including area within Giant Forest. The Sequoia Field Station was closed and evacuated on September 12, 2022 and remained closed until March 9, 2022 primarily due to the surface water treatment plant remaining offline.

Giant Forest canopy with wildfire smoke. Photo credit: Wendy Baxter

News

Staff Updates

We welcome Jessica Malisch as our new Associate Director of the UC Merced Natural Reserve System, and Steve Monfort as the new Executive Director of the UC Natural Reserve System. Steve, Jessica, and Breezy spent a lovely day walking in the Mariposa Grove of Giant Sequoias and touring the Yosemite Field Station as part of Steve's whirlwind tour of all 41 field stations and reserves in the UC-wide system.

COVID-19 Operations

The Yosemite and Sequoia Field Stations continued to operate throughout the global pandemic at varying levels depending on current conditions within the county and state. We updated our UC Merced Natural Reserves and Field Stations: Standard Operating Procedures for Phased Reopening Given COVID-19 to align with UC Merced guidance three times in FY21-22 to align with UC Merced vaccination policies, CDC guidance on testing, and CDC guidance on quarantine and isolation. We continue to operate under our COVID-19 SOP and adjust our policies as the pandemic continues.

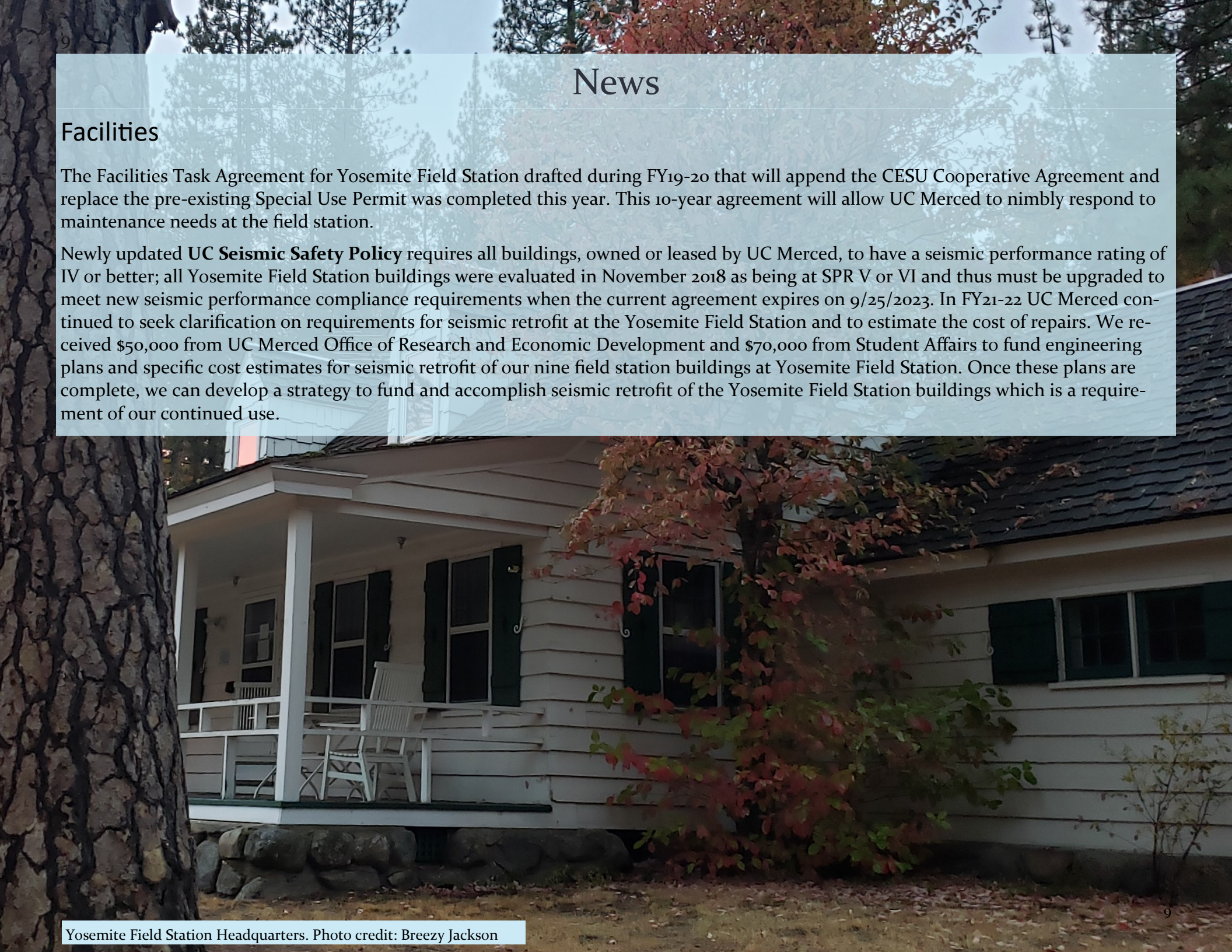
Steve Monfort and Breezy Jackson standing inside a giant sequoia cat face in the Mariposa Grove. Photo credit: Jessica Malisch

News

Facilities

The Facilities Task Agreement for Yosemite Field Station drafted during FY19-20 that will append the CESU Cooperative Agreement and replace the pre-existing Special Use Permit was completed this year. This 10-year agreement will allow UC Merced to nimbly respond to maintenance needs at the field station.

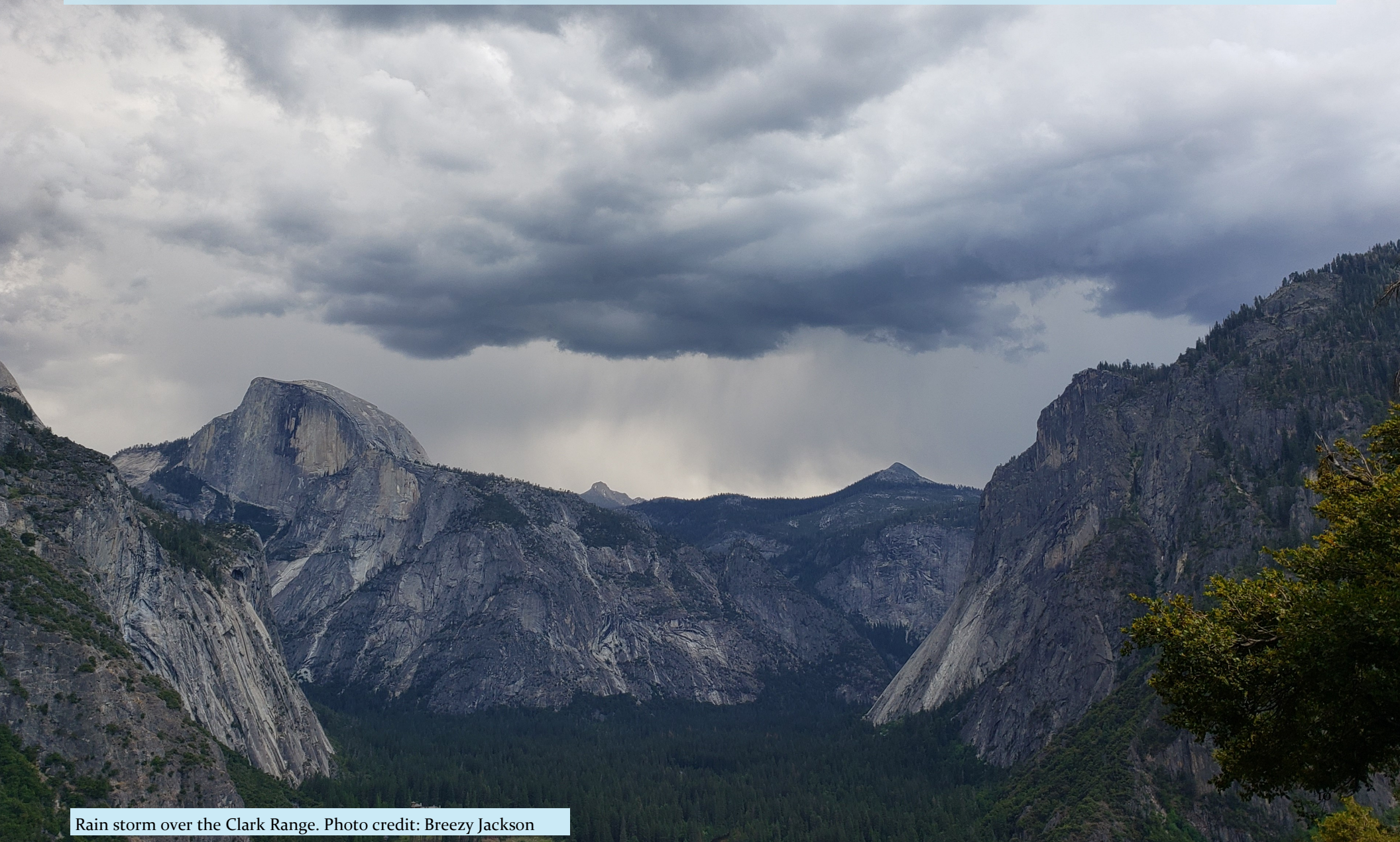
Newly updated **UC Seismic Safety Policy** requires all buildings, owned or leased by UC Merced, to have a seismic performance rating of IV or better; all Yosemite Field Station buildings were evaluated in November 2018 as being at SPR V or VI and thus must be upgraded to meet new seismic performance compliance requirements when the current agreement expires on 9/25/2023. In FY21-22 UC Merced continued to seek clarification on requirements for seismic retrofit at the Yosemite Field Station and to estimate the cost of repairs. We received $50,000 from UC Merced Office of Research and Economic Development and $70,000 from Student Affairs to fund engineering plans and specific cost estimates for seismic retrofit of our nine field station buildings at Yosemite Field Station. Once these plans are complete, we can develop a strategy to fund and accomplish seismic retrofit of the Yosemite Field Station buildings which is a requirement of our continued use.



Yosemite Field Station Headquarters. Photo credit: Breezy Jackson

Research

Research at Yosemite and Sequoia Field Stations spans disciplines from the natural sciences to the humanities and arts. We support students, faculty, artists, and public servants whose work includes philosophy, visual art, music, writing, fires, forests, water, wildlife, plants, and much more. The following represents some highlights from our year of research in review.



Rain storm over the Clark Range. Photo credit: Breezy Jackson

Research

New Weather Station

Wendy Baxter from the UC Natural Reserve System successfully updated an old **weather station** in the Mariposa Grove of Giant Sequoias and added it to the Natural Reserve System network of weather stations. Data from the new station is now streaming to both Dendra and the California Data Exchange Center.

Weather station in the Mariposa Grove. Photo credit: Wendy Baxter

Research

Giant Sequoias

The Ancient Forest Society (formerly **The Marmot Society**), continued their work describing water use by giant sequoias in Yosemite and Sequoia-Kings Canyon National Parks during drought and following prescribed fire. Preliminary results from their work include first-time documentation of foliar uptake of water by giant sequoias, documentation of high transpiration rates especially by trees growing in wet sites, and evidence that trees primarily get their water from deeper soils than from groundwater, surface water, or foliar uptake. The Tharps-Hazelwood Prescribed Fire burned through their study sites in Giant Forest in June 2022 which will allow them to compare sequoia water use before and after fire.

Seth Davis from **Colorado State University** and field technician Nate Foote are investigating the life history of *Phloeosinus punctatus* (the western cedar bark beetle, WCBB) and *Phloeosinus rubicundulus* (the giant sequoia bark beetle, GSBB) to determine whether these beetles pose a threat to giant sequoias and to test treatments that may reduce deleterious impacts to the trees. Ongoing research efforts include gaining better understanding of the basic biology, ecological interactions, and potential pest status of the giant sequoia bark beetle in Yosemite and Sequoia-Kings Canyon National Parks. Multi-year field observations and a combination of field and laboratory studies have generated data for constructing beetle phenological models. A recent key finding includes confirmation of more than one generation per year of the beetle in Giant Forest of Sequoia National Park in areas following a the Tharps-Hazelwood prescribed burn in June 2022 and in Mariposa Grove of Yosemite following the Washburn Fire in July 2022. The **National Parks Service** and **US Geologic Survey** have joined this effort by describing tree demographics, soil water, and soil microbial properties in both groves.

View from a giant sequoia. Photo credit: Breezy Jackson

Research

Evolution and Adaptation to Climate Change

As climate change and drought put pressure on California native flora, researchers are continuing to describe the genetic traits of plant species that will influence their evolutionary trajectory. The Ferris and Van Bael Labs from **Tulane University** are continuing their work describing monkeyflower evolution and adaptation. Diana Tataru experimentally studied two species of monkeyflowers that naturally interbreed (hybridize) in the park, *Mimulus guttatus* (Seep Monkeyflower) and *Mimulus laciniatus* (Cut-leafed Monkeyflower). Preliminary analyses suggest potential hybrid advantage in both natural hybrid zones and parental species' habitats. This research contributes to the field of evolutionary biology by further developing the understanding of why gene flow occurs between species and whether it is beneficial. Caroline Dong reports that she is still analyzing the data from 2021 and collecting data for the 2022 experiment, as part of their long-term field study (years 3 and 4 respectively, out of 5 years total) to examine temporal variation in selection on *Mimulus guttatus* and *M. laciniatus* in their differential habitats. She reports higher survival and fitness in 2021 compared to the first two years of the study (2013, 2019). It will be interesting to compare environmental factors that may have contributed to this between the years. Rachel Prunier from **UC Riverside** inventoried mountain pride genetic diversity across California including in the Yosemite and Sequoia-Kings Canyon National Parks (see special science feature on page 14). Emily Moran from **UC Merced** is investigating demographic responses to climate in *Pinus ponderosa, P. jeffreyi,* and *P. monticola* of different genetic backgrounds which will address how competition, variation, and disturbance may influence range-shifts of pines under climate change. Finally, Bruce Baldwin and colleagues from **UC Berkeley** conducted research on novel diversity in the flowering plant genus *Collinsia* (Plantaginaceae) resulting in preparation of formal descriptions of three new endemics of metamorphic exposures in the upper Merced River watershed. These new-to-science plants represent an example of incipient diversification in the upper Merced River region. Fieldwork based out of the Yosemite Field Station made it possible to make more detailed observations of these new-to-science plants than would have been possible from herbarium specimens alone.

Merced River Canyon in full bloom. Photo credit: Breezy Jackson

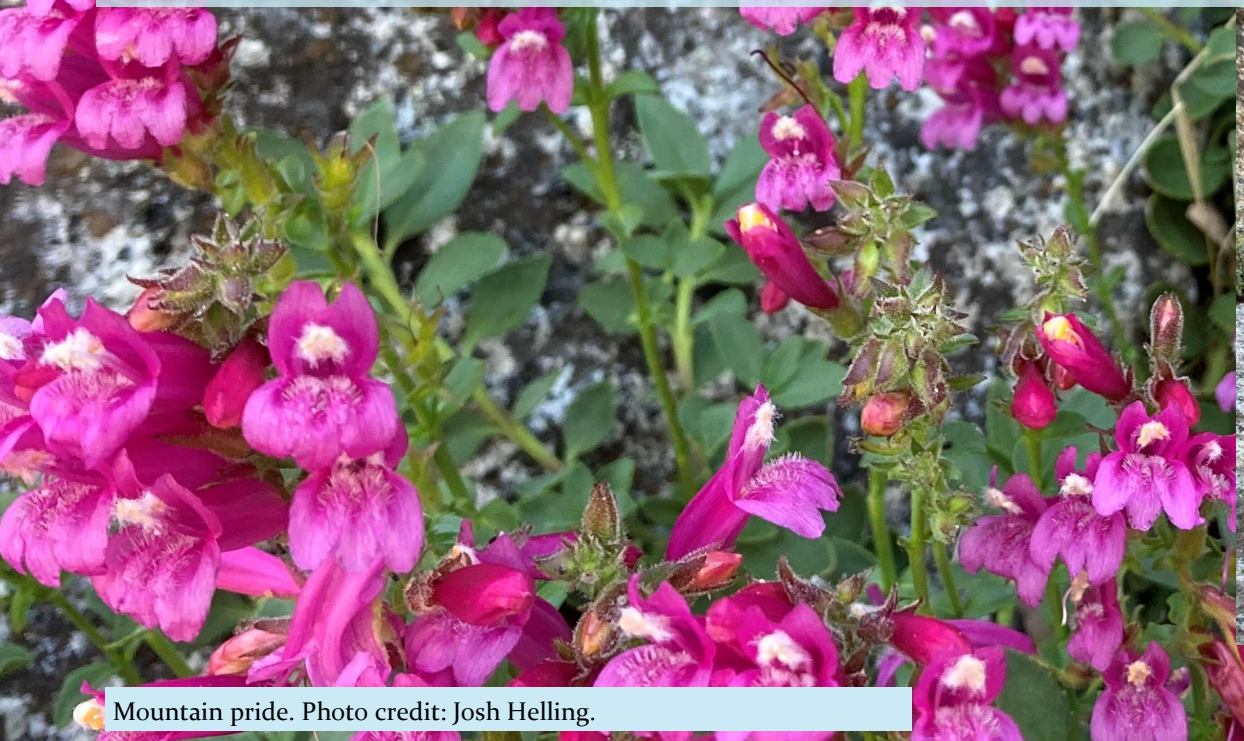
Science Feature

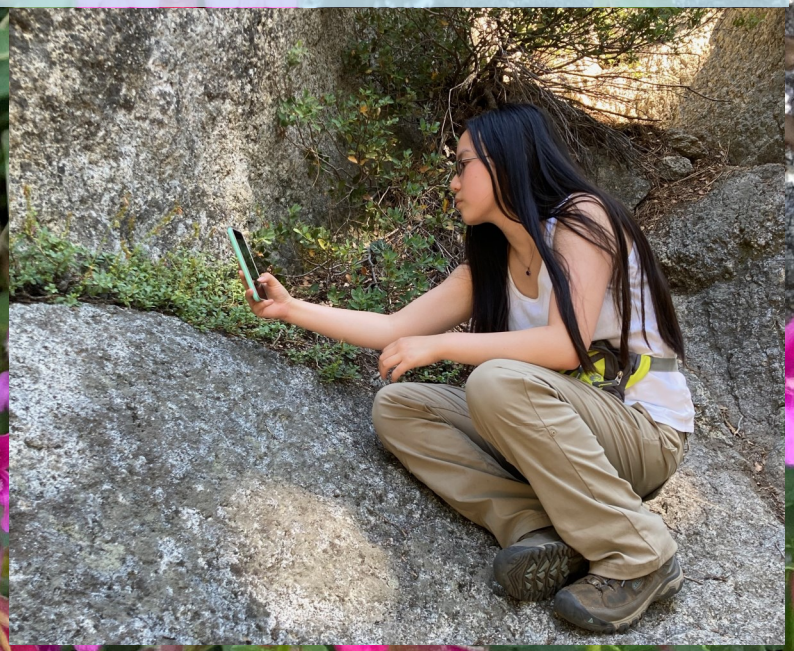
Mountain Pride by Rachel Prunier (UC Riverside)

After a long day of sampling my student Nicole and I went outside to find the Milky Way. Taking advantage of the clear view of the sky created by the parking lot at Wolverton in Sequoia National Park, we lay down and gazed. Nicole, a first generation college student from the LA basin (lower right), had never seen stars before, much less the milky way, and she was blown away. As part of the California Conservation Genomics Project we are investigating local adaptation and gene flow in mountain pride (Penstemon newberryi). To do so, we sampled across its range, from the southern end of the Sierra Nevada to Mount Shasta. The southern half of our trip was anchored by stays at the UCNRS Sequoia and Yosemite field stations.

Because we were collecting across a large area in a short time (we traveled over 5000 miles in five weeks) most of our days were spent driving between sampling sites. A typical day would involve 6-8 hours of driving through the parks and the surrounding national forests with 4-6 stops to sample mountain pride. Sometimes we got to take short hikes to find the plants, but more often we sampled on the side of the road. Mountain Pride specializes in cracks in bare granite, so exposed rocks on road sides are prime habitat.

A five week field trip would be a challenge for anyone, but with two toddlers, I worried about being away from home for so long. Thankfully, UC Davis is committed to inclusion. Their policy allowing caregivers to travel to field sites made it possible for me to bring my children into the field, and for Nicole and I to sample over 130 individuals at 63 locations. We are currently awaiting their sequenced genomes.



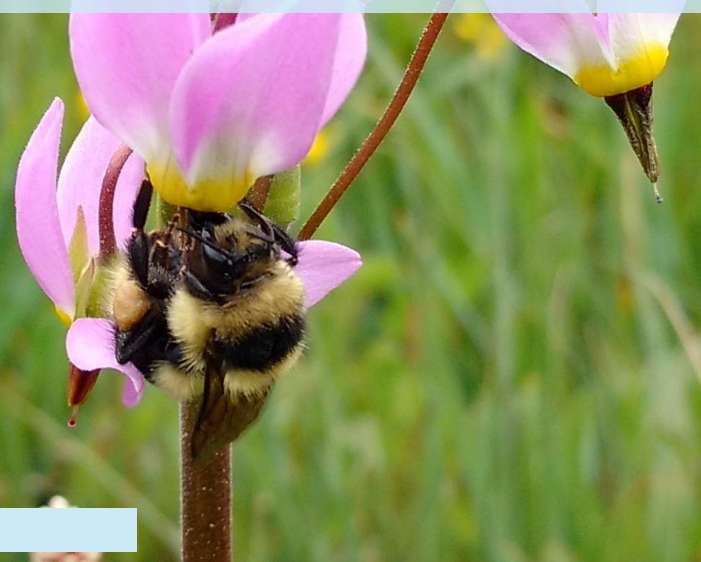


Mountain pride. Photo credit: Josh Helling.

Research

Wildlife

On the wildlife front, the **Sierra Nevada Inventory and Monitoring Program** and the **Institute for Bird Populations** used the Yosemite Field Station to base their annual training for field technicians monitoring songbird populations throughout the central southern Sierra parks including Yosemite, Sequoia-Kings Canyon, and Devil's Postpile. This year they published their first report of trends in bird abundance in the Sierra Nevada parks, based on monitoring data collected between 2011 and 2019. In general, this analysis documented relative stability of bird populations, however, several species exhibited either increasing or decreasing trends. Decreasing trends were more common in Sequoia and Kings Canyon National Parks—where drought has been more severe—while increasing trends were more prevalent in Yosemite National Park and Devils Postpile National Monument. During the 2022 season, field crews successfully completed the tenth year of data collection for this ongoing program. Researchers from **Yosemite National Park** performed visual surveys for rare amphibians and aquatic invasive species, as well as collecting eDNA samples at sites throughout the Merced River watershed. Researchers from **UC Berkeley** also utilized Yosemite Field Station to study the conservation and population genomics of two native and ecologically interesting ant species: the winter ant (*Prenolepis imparis*) and the kidnapper ant (*Polyergus mexicanus species complex*). They are collecting specimens from 150 different locations in California and will sequence the complete genome of at least one individual per location to identify regions where populations possess high levels of genetic diversity as well as to reconstruct the evolutionary history of the species and identify genomic regions that may be responsible for some of the key adaptations that contribute to the kidnapper ants' unique life history. Finally, Gabe Foote from **UC Davis** is studying bee responses to fire in the Sierra National Forest. This summer was the 2nd season of a long-term monitoring project for documenting the community responses and successional patterns of wild and native bees to the Creek Fire event of 2020. Preliminary results suggest bee abundance and diversity is now greater in burned versus undisturbed stands, regardless of burn severity. Of note, bumblebee (*Bombus* spp.) abundance appears to have significantly increased from 2021-2022, particularly in moderate severity burned patches located in the lower montane life zone.



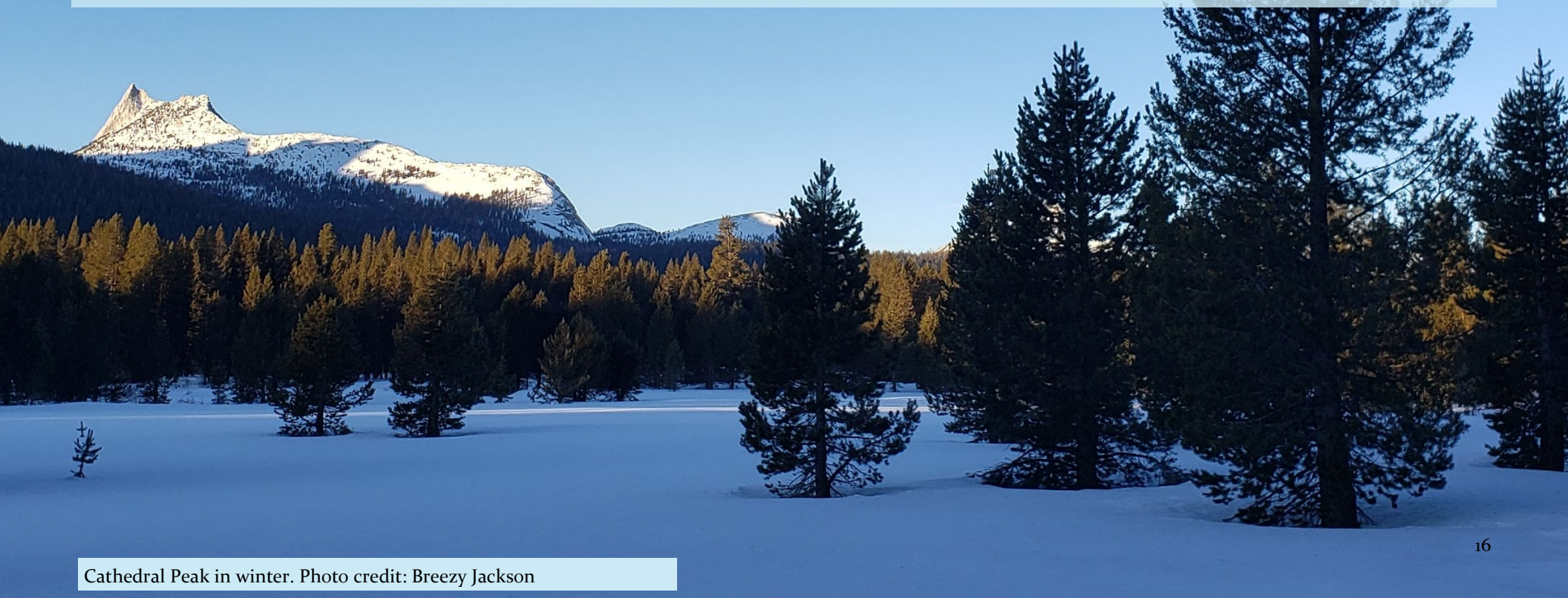
Shooting stars and bees. Photo credit: Hollis Woodard

Research

Fire, Hydrology, Soils, and Meadow Restoration

In the Illilouette Creek Basin in Yosemite, researchers continue to study hydrology, snowpack, soil moisture, vegetation, and wildlife responses to restored wilderness fire regimes. Last winter researchers from **UC Berkeley** and **University of Nevada, Reno** used the Yosemite Field Station as a "base camp" for trips to measure snowpack in the basin. These measurements, combined with time lapse imagery from cameras placed throughout the watershed, will help them to better understand how the water stored in snow is affected by vegetation cover changes following wildfire. In addition, researchers from **UC Berkeley** and **Point Blue Conservation Science** described bat and songbird responses to restored fire (see our special science feature on page 17).

Researchers are also studying geomorphology and meadow restoration in Sequoia National Park. In the Sierra Nevada, erosion gullies are a common legacy impact to meadows from grazing that occurred prior to Park protection, including meadows throughout the vast Park wilderness. At Log Meadow in the Giant Forest **UC Davis** researchers are testing a method of small gully restoration that involves creating hay bales to fully fill a gully using hand tools - scythes, hay forks, and manual hay balers - that could be deployed in the Wilderness, where power equipment is prohibited. The filled gully will disperse water onto the dewatered meadow, stimulating wetland plant growth, and transplants will be planted directly into the hay to grow and replenish the hay that decomposes through time.



Cathedral Peak in winter. Photo credit: Breezy Jackson

Science Feature

Songbirds and Wildfire by Vince Webber (Point Blue Seasonal Ecologist)

with Editing by Alissa Fogg (Point Blue) and Zack Steel (UC Berkeley)

Our days in the Illilouette Creek Basin began in early twilight, crawling out of a sleeping bag to start bird surveys. Mornings involved 3 to 4 miles of route-finding off trail through a gauntlet of fallen logs, thorny shrubs, steep slopes, and the otherwise unpredictable. One of these surveys led us up an unnamed granite dome with a sheer face scraped flat by glaciers just like Half Dome. From the summit, a cast of three fledgling Peregrine Falcons flew through the air, likely hatched from an aerie on the precipitous face below.

The remoteness of the Yosemite wilderness has allowed for many natural processes to remain intact. In the Illilouette Basin, the trees are behemoths, resilient to a long-standing fire regime. The National Park Service has prioritized letting lightning-ignited fires burn, and partnering with UC Berkeley and Point Blue Conservation Science, who I spent this past summer season working for as a seasonal biologist, to monitor wildlife in this fire-diverse system. Our data will be used to help assess how bird, bat and plant diversity respond to dynamic fire management in the Sierra Nevada and inform how fire in the system is managed going forward.

Our season in the wilderness came to a quick end. We received a text on our satellite devices that the Washburn Fire had started near Mariposa Grove. By that evening a plume of smoke rose like a cumulus cloud in the distance. A haze settled overnight, enough to obscure the horizon. For our safety, we hiked out with the sun looming red behind the clouds filtering the light into sepia tones. Now as we sift through the summer's data, the Red Fire burns through the Illilouette Basin and many of our survey locations, continuing the constant reshaping of the landscape and its biodiversity. As climate change brings more severe fires, our data will help managers understand the implications of expanding a managed wildfire program across the entire Sierra.

Tree behemoths and field technician Vince Webber. Photo credit: Rya Rubenthaler

Research

Visual Arts

The Yosemite and Sequoia Field Stations continues to support humanities and arts research in the parks. This year **Keith Jinsub Kim**, a **Fulbright Fellow** from South Korea, worked on his photography project entitled "Leave No Trace" which seeks to bring awareness to human impacts on preserved areas. Keith says of the project, 'Since I discovered it is hard to find nature with no human trace, I started taking photos with the question "How should man-made structures or humans be photographed to define their relationship with nature?'" Keith's work will be on exhibit in the Korea Fulbright Office in Seoul starting October 11, 2022. See more from "Leave No Trace" in the following pages.

From the collection "Leave No Trace". Photo credit: Keith Jinsub Kim

From the collection “Leave No Trace”. Photo credit: Keith Jinsub Kim

From the collection “Leave No Trace”. Photo credit: Keith Jinsub Kim

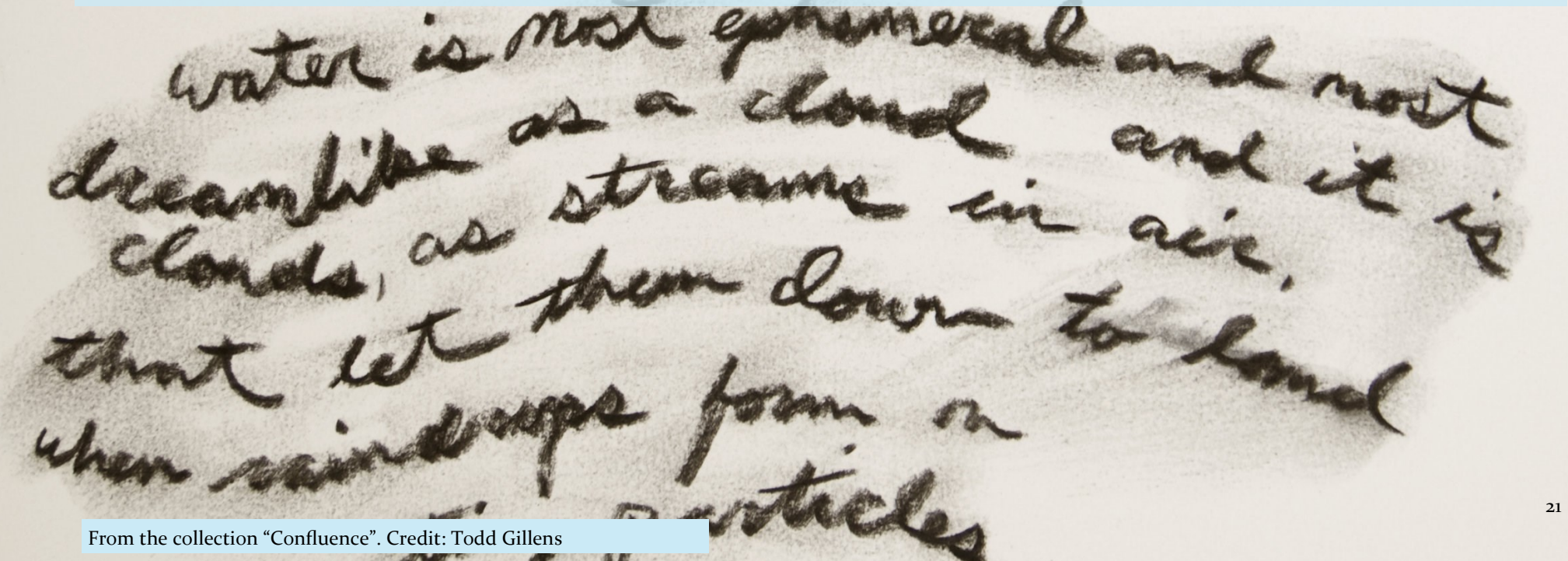
Research

Arts Continued

Alma Alvarez from **UC Los Angeles** worked on a project called Re-membering Wa-kal-la which is a "series of photographs, soundscapes, and poetry of the Merced River exploring the concept of the interdependent relationship between voice and water. The Merced carries a Christian colonial name (named after Our Lady of Mercy), however, this river was home to the Ahwahnechee, Southern Sierra Miwok and Paiute peoples. The river was simply called Wa-kal-la (Ahwahnechee for 'the river'). The photographs, soundscapes, and poetry will reproduce its native name seeking to (re)member and reproduce a name along with highlighting the ancient relationships of Native Americans with the river. Through this act of (re)membering we hope to highlight ancient and sustainable relationships between humans and the river to explore the interdependency of the human and river voices."

Corey Fogel from **UC Irvine** examined the utility of abstract notation found in nature and public spaces for composers and performers of improvisational music. Kevin O'Connor from **UC Davis** worked on a script for an art film that aims to help different communities feel into emerging science on forest/plant communication through a guided imaginary. This film will debut at festivals in 2023.

Todd Gillens worked on his project entitled Confluence. Todd says, "Confluence is an exploration of stream science methods and findings, and their transfer to lay contexts as urban artworks. My time in the field and at field stations with researchers will provide opportunities for observation and discussion, recording and reflection. In subsequent phases these data will be developed into texts, to be inscribed along urban curbs in several cities. The project intention is to link large-scale natural water-system behavior with urban conditions and audiences, advancing awareness of these systems as well as the associated descriptive vocabulary."



From the collection "Confluence". Credit: Todd Gillens

Research

Arts Continued

Finally, **Andie Thrams** continued her work at Sequoia Field Station on Forest Prayer Flags as well as starting a new collaborative project at Yosemite Field Station called HOPE?. HOPE? is a collaborative art project created by Susan Lowdermilk, Donna Thomas, Peter Thomas, and Andie Thrams. Through field work in recently burned and green forests in Oregon and California, the artists investigated the complex topics of tree mortality, catastrophic wildfire, and climate change. They have created a reliquary in an edition of 32 copies, comprised of twelve artists' books and artifacts to bear witness to the devastation of western forests and grapple with the question of hope during this pivotal moment in the Anthropocene epoch. HOPE? was shared publicly for the first time at the CODEX VIII Book Fair and Symposium: Words on the Edge in April 2022, and is part of the worldwide project, Extraction: Art on the Edge of The Abyss, which investigates climate change and human overconsumption of natural resources.

Andie Thrams paints in Giant Forest. Photo credit Dennis Eagan

Research

Humanities

This year Yosemite Field Station was also a place for philosophy and ethics research. Nigel Hatton from **UC Merced** explored the use of public lands for incarceration and the impact of incarceration on humans beings and the environment. Holley Moyes, also from **UC Merced,** examined the influence of darkness on human cognition and Francisco Muñoz from **UC Santa Cruz** studied the experience of veterans in nature and National Parks.

Pacific Dogwood in bloom. Photo credit Breezy Jackson

University Courses

A slow return to in-person instruction allowed for a handful of university courses in FY21-22.

Environmental Humanities: Making of the Modern Word. UC San Diego, MMW14/121. Students engaged in programing from a humanities perspective, combining a class, outdoor experience, and volunteer work with the NPS.

Geomorphology and Surface Processes. UC Merced, ESS 150. Students met with Park Geologist Greg Stock to conduct a short research activity pertaining to rockfall hazards (measuring boulders), and visited Yosemite Valley sites that exemplify glacial geomorphology for a "show-and-tell" style field trip.

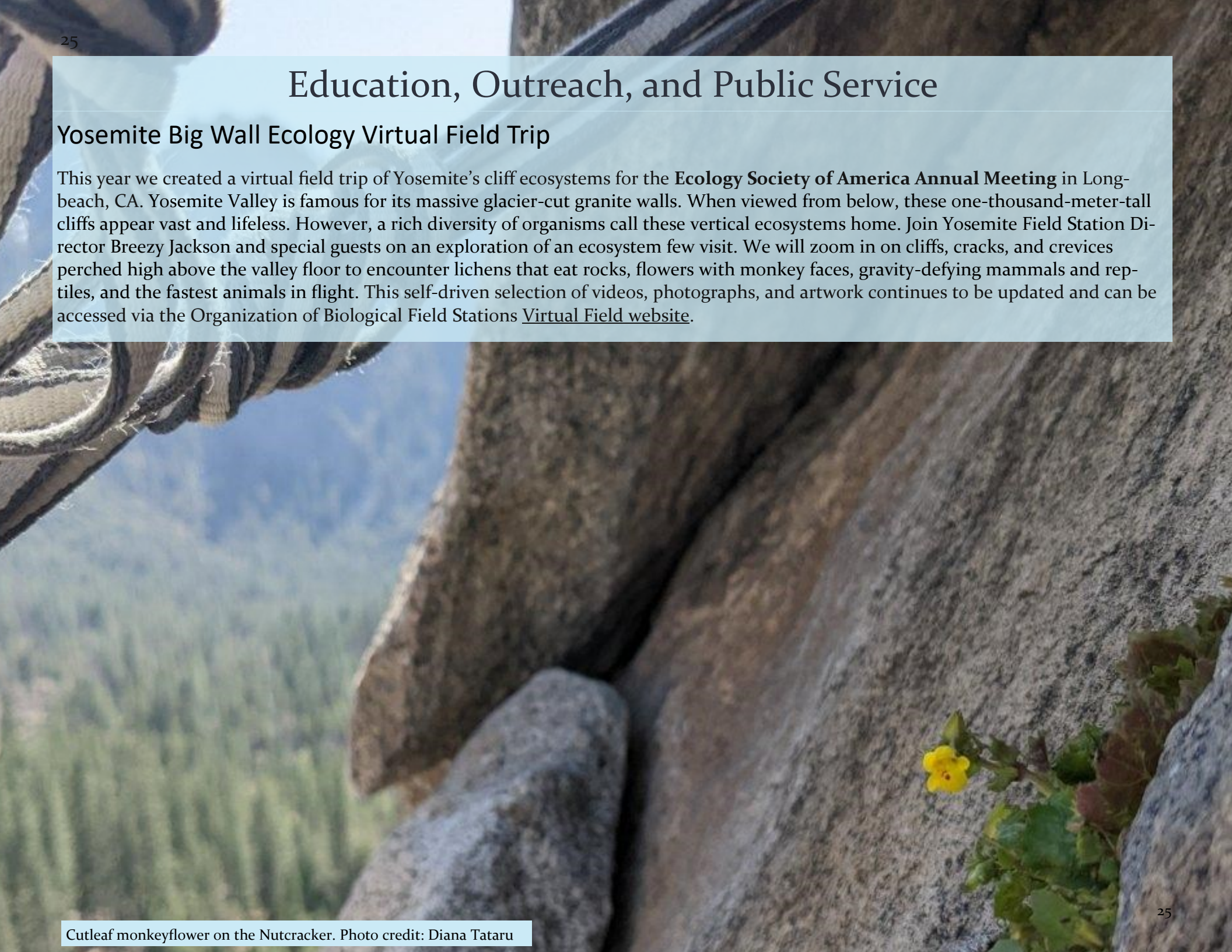
Environmental Writing. UC Merced, WRI 114. Via a series of short hikes, students explored environments and ecosystems in which animals that are the subject of students' field guide entry and nonfiction article assignments live. Using the Grinnell Method of field note booking (visual and verbal reporting), students gathered contextual information about the local animals in which they are interested.

Geologist Greg Stock describes the glacial history of Yosemite Falls.
Photo credit: Breezy Jackson

Education, Outreach, and Public Service

Yosemite Big Wall Ecology Virtual Field Trip

This year we created a virtual field trip of Yosemite's cliff ecosystems for the **Ecology Society of America Annual Meeting** in Long-beach, CA. Yosemite Valley is famous for its massive glacier-cut granite walls. When viewed from below, these one-thousand-meter-tall cliffs appear vast and lifeless. However, a rich diversity of organisms call these vertical ecosystems home. Join Yosemite Field Station Director Breezy Jackson and special guests on an exploration of an ecosystem few visit. We will zoom in on cliffs, cracks, and crevices perched high above the valley floor to encounter lichens that eat rocks, flowers with monkey faces, gravity-defying mammals and reptiles, and the fastest animals in flight. This self-driven selection of videos, photographs, and artwork continues to be updated and can be accessed via the Organization of Biological Field Stations Virtual Field website.



Cutleaf monkeyflower on the Nutcracker. Photo credit: Diana Tataru

Education, Outreach, and Public Service

Adventure Risk Challenge

Adventure Risk Challenge arrived to Yosemite Field Station in May and June 2021 to prepare for their summer programs including two courses run out of Yosemite Field Station and Sagehen Creek Field Station respectively. Because of a baby boom among the full-time staff, the decision was made to postpone the Sequoia Field Station course this year. Summer courses are offered to ten to twelve high school students who are first-generation, English language learners, or students who are motivated to experience challenging outdoor and academic adventure. The courses run for a full month as students are exposed to the beauty of the Sierra Nevada and instructed in language arts, environmental science, writing, and backcountry navigation. ARC was featured in multiple news outlets in FY21-22 including KVPR, Yosemite Conservancy Magazine, and Mariposa Gazette. You can read poetry from ARC students here.

Adventure Risk Challenge students learn navigation. Photo credit: ARC

Education, Outreach, and Public Service

Yosemite Leadership Program Capstone—Native Pollinator Garden

The Yosemite Field Station was selected by a cohort of **Yosemite Leadership Program** students for their capstone project in the Fall 2021. Students created a work plan to implement a native plant garden at the field station headquarters which will attract native pollinators and provide an interpretive site for studying and understanding native plants in Wawona.

UC Merced students learn about native plants. Photo credit: Breezy Jackson

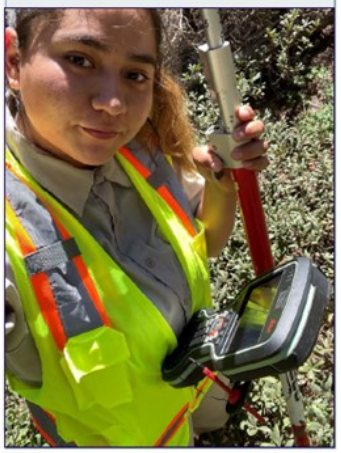
Education, Outreach, and Public Service

Yosemite Leadership Program Summer Internship

Spring 2022 also brought the return of the **Yosemite Leadership Program Summer Internship**. Through a cooperative effort with Yosemite National Park, five students were offered 12-week paid internships with Yosemite National Park work centers. Students who complete the program receive a direct hiring authority allowing them to be non-competitively hired into a permanent position in the National Park Service. The student projects spanned a variety of disciplines from engineering to interpretation (see descriptions below). This year, Yosemite Field Station had our very own outreach intern, Caitlyn Klemm. Besides contributing social media content to convey the work supported by Yosemite Field Station to our followers, Caitlyn also wrote an article for the Organization of Biological Field Stations Newsletter (right) as well as creating an awesome story map about her experience.

Photos: YLPSI intern Mar teaches art class at the Yosemite Conservancy Nature and Art Center (top); Caitlyn helps with bighorn sheep surveys (middle) Joey conducts land surveys (bottom).

For more information about YLPSI: https://ylp.ucmerced.edu/ or contact Breeanne Jackson at bjackson10@ucmerced.edu.



A TALE OF TWO FIELD STATIONS—BY SHEENA PARSONS

Like so many others, 2020 had me longing to travel. So naturally, when the OBFS meetings went virtual, it was hard to resist bidding on station trips at the auction. I managed to win two trips to stations very different from my own and in keeping with that "go big or go home" attitude, I planned one epic road trip with my family to visit both in a little under two weeks in June.

My first stop was to visit John Gordon at CMUBS on Beaver Island, MI. CMUBS has great facilities and access to explore so many amazing spots. I recommend the trip to Miller's Marsh if you can make it to the island early.

Next we headed east and eventually made it over to see Phoebe Jekielek at Hurricane Island, Maine. Our stay on that island happened to overlap with a student group that was at camp that week, *(continued p. 4)*

"Yosemite Leadership Program Summer Internship continues to promote a mutual fellowship between the park and UC Merced"

YOSEMITE FS/NATIONAL PARK SERVICE INTERNSHIP - BY CAITLYN KLEMM, INTERN

The Yosemite Field Station is celebrating our 6th year hosting The Yosemite Leadership Program Summer Internship (YLPSI). This program offers a competitive and life-changing opportunity for undergraduate students from University of California, Merced to develop adept leadership qualities and explore a tailored pathway toward a career in land management.

Each intern is offered a position in a National Park Service or park partner work group. This summer, YLPSI hosts five interns: art and nature center intern Mar Lopez, engineering intern Joey Rivera, Indian cultural demonstrator Paul Sugimoto, Merced River restoration intern Karla Destephen, and Yosemite Field Station outreach intern Caitlyn Klemm. All five interns share a cabin at the Yosemite Field Station in Wawona and commute to their workplaces across the park from Curry Village to Tuolumne. Their experiences include astronomy teaching, land surveying, bead making, photo monitoring, and pollinator inventorying. Six weeks into their respective seasons, each intern is prompted with initiating a capstone project which encapsulates their learned skills and knowledge from over the summer. These projects extend from the digital compilation of research in the parks via a story map to designing a new campsite amphitheater.

Upon completion of their internship, interns receive a monetary education award as well as a Direct Hiring Authority with the National Park Service which allows them to be non-competitively hired into a permanent position. Yosemite Leadership Program Summer Internship continues to promote a mutual fellowship between the park and UC Merced by educating curious and driven students about National Park Service work and seeing them matriculate to the work force after graduation.

Education, Outreach, and Public Service

More Offerings

In addition to all the other great programs at Yosemite Field Station, we also co-hosted an intensive **California Naturalist** course with **Yosemite Sierra Summer Camp** in October 2021 with speakers from the North Fork Mono Indians, Yosemite National Park, Soquel Meadow, and the UC Merced Natural Reserve System as well as hosting an **Udall Foundation Parks in Focus** Train-the-Trainer workshop.

Hydrologist Cat Fong demonstrates how to measure stream flow the old fashioned way. Photo credit: Breezy Jackson

Meetings and Retreats

Yosemite Field Station is a terrific place to hold medium-size meetings, conferences, and lab retreats. Both Yosemite and Sequoia Field Stations are also available for writing and work retreats for individuals or small working groups. Highlights from the past year include a visit from **The National Parks Institute** for a portion of their curriculum in January 2022. Hosted by **UC Merced**, NPI is an executive level leadership retreat for national parks and public lands managers from across the globe. The tenth annual **Yosemite Symbiosis Workshop**, which is an integrative meeting of biologists working on symbiosis, cooperation, and mutualism, was held at Yosemite Field Station in May 2022. This meeting attracts researchers from all over the world to share their research. The workshop is co-organized by **UC Merced** professor Carolin Frank and Joel Sachs from **UC Riverside**. Ash Zemenick from **Sagehen Creek Field Station** (UC Berkeley) and Jorge Ramos from **Jasper Ridge Reserve** (Stanford) joined our own Breezy Jackson for a retreat centered on furthering equity, justice, and diversity at field stations. The **UC Merced Masters of Management** students made a visit to Yosemite Field Station to study the National Park Service and University of California partnership. The creative writing faculty at **UC Merced** held their **Rethinking the Writing Workshop** to cultivate creative writing curriculum and work on individual writing projects at Yosemite Field Station in May 2022. The NRT Convergence of Nano-engineered Devices for Environmental and Sustainability Applications (**CONDESA**) program at **UC Merced** hosted prospective undergraduate and graduate students for an incubator retreat in June 2022. Finally, we hosted laboratory retreats from UC Merced, UC Davis, UC Berkeley, UC Irvine, and Stanford University.

From left to right: Ash Zemenick, Breezy Jackson, Jorge Ramos, and Adam Martinez sharing strategies for increasing belonging at field stations. Photo credit: Tourist :-)

Publications and Exhibitions

Gilens, Todd. “Confluence: Grids, Ecology, and 99-Character Statements.” *Ecotone*, 9 Nov. 2021, https://ecotonemagazine.org/map/confluence-grids-ecology-and-99-character-statements/.

Gilens, Todd. Confluence. 2021, FOREST FIRE, Truckee Community Recreation Center, Truckee, CA.

Iskin, Emily P., and Ellen Wohl. “Wildfire and the Patterns of Floodplain Large Wood on the Merced River, Yosemite National Park, California, USA.” *Geomorphology*, vol. 389, Sept. 2021, p. 107805, https://doi.org/10.1016/j.geomorph.2021.107805.

Jackson, Breeanne K. *Big Wall Ecology in Yosemite – The Virtual Field*. 4 Aug. 2021, https://thevirtualfield.org/video/big-wall-ecology-in-yosemite/.

Jackson, Breeanne. *Field Trip 11: Big Wall Ecology in Yosemite*. 2021, https://www.esa.org/longbeach/program/field-trips-schedule/.

Jenkins, Jeffrey, Felber Arroyave, et al. “Assessing Impacts to National Park Visitation From COVID-19: A New Normal for Yosemite?” *Case Studies in the Environment*, vol. 5, no. 1, Sept. 2021, https://doi.org/10.1525/cse.2021.1434075.

Jenkins, Jeffrey, Jan Van Wagtendonk, et al. “The Evolution Of Management Science To Inform Carrying Capacity Of Overnight Visitor Use In The Yosemite Wilderness.” *Journal of Wilderness*, vol. 27, no. 2, Aug. 2021, pp. 23–39, https://ijw.org/evolution-management-science-carrying-capacity-overnight-visitors-yosemite-wilderness/, https://ijw.org/evolution-management-science-carrying-capacity-overnight-visitors-yosemite-wilderness/.

Lowdermilk, Susan, et al. About HOPE? Independently published, 2022.

Lowdermilk, Susan, et al. HOPE? 2022, CODEX VIII Book Fair and Symposium: Words on the Edge, Berkeley, CA.

Merriam, Kyle E., et al. “Reestablishing Natural Fire Regimes to Restore Forest Structure in California’s Red Fir Forests: The Importance of Regional Context.” *Forest Ecology and Management*, vol. 503, Jan. 2022, p. 119797, https://doi.org/10.1016/j.foreco.2021.119797.

Thrams, Andie. Forest Prayer Flags. 2021, Yosemite Renaissance 36, Carnegie Arts Center, Turlock, CA.

Thrams, Andie. Forest Prayer Flags. 2021, Sitka Center for Art & Ecology Invitational, World Forestry Center, Portland, OR.

Thrams, Andie. Wander, Wonder. 2021, FOREST FIRE, Truckee Community Recreation Center, Truckee, CA.

Acknowledgment

Thank you to the students, faculty, staff, professionals, and community members who work together with Yosemite and Sequoia Field Stations to support and conduct research, education, and public service in the southern central Sierra Nevada of California.

A black bear strolls through Giant Forest. Photo credit: Anthony Ambrose

Engage

Follow the links on each logo to support Yosemite and Sequoia Field Stations.

YOSEMITE FIELD STATION

UC MERCED

SEQUOIA FIELD STATION

UC MERCED