



Spring News from Sedgwick Reserve

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Update on Reopening during the COVID-19 Pandemic

Sedgwick Reserve continues to be open to research with COVID precautions in place. We will be happy to see the return of some classes beginning in spring quarter. Interested instructors should reach out to Nikki

Evans, nevans@ucsb.edu, for information. The University has not yet approved onsite public programs at Sedgwick Reserve. We miss sharing hikes with you and are hopeful that soon, perhaps the summer or fall, we will be able to do so once again. Stay tuned for updates and announcements. Read on to see some of the hard work going on behind the scenes, and how you can get involved virtually.

Sedgwick Lunch and Learn Talks in April

We are excited to announce **Lunch and Learn Talks** on Zoom this spring! Read below for the descriptions. Space is limited. Registration is required.



"Geology Underfoot in Southern California"

Art Sylvester UCSB

***Tuesday, April 13
12PM-1PM PST***

This talk is a preview of geologic wonders that are just out there waiting for you to visit and learn about once you feel comfortable breaking out of your COVID isolation and seeing the world again. We'll "virtually visit" several sites that make splendid half day, one day, and overnight trips from Santa Barbara County, sites where you can get out and put your hands and feet on real live



"Understanding the distributions of annual plant species in a California grassland"

Kenji Hayashi UCLA

***Tuesday, April 27
12PM-1PM PST***

Plant communities in nature often exhibit striking spatial variation in species composition, such that different species are distributed in different parts of the same landscape. This variation can arise from species' responses to the abiotic environment (e.g. soils), the biotic context (e.g. competitive interactions among neighboring plants), or a combination of both.

During this talk, Kenji will share some of his ongoing research in the serpentine

geology.

Check out the recent article in the Santa Barbara Independent about Art [here](#)

annual grasslands of Sedgwick Reserve disentangling the factors that shape the distributions of annual plant species in this natural landscape.

Register for Art's talk
Here

Register for Kenji's talk
here

Researcher Spotlight ***Jacob Levine***



Jacob Levine is a 2nd year PhD student pursuing a degree in Ecology and Evolutionary Biology at Princeton University. Since late December 2020, he has been working at Sedgwick Reserve where he is conducting the experimental phase of his work on water competition. His research will contribute to the unsolved problem of how species of similar ecology coexist in nature. Jacob is interested in how a plant's ability to survive in wet and dry conditions may serve as a tradeoff that allows similar species to coexist. Mediterranean plants are specific to Jacob's research because their short lifespan is convenient to study, and because of their incredible diversity.

Jacob expressed ebullience when speaking about conducting research at Sedgwick Reserve, "Sedgwick is a beautiful site. The plants are charismatic and interesting, which makes it a great place to work." Jacob's work is in the realm of physiological ecology, which is a field that looks at how the characteristics of living organisms interact with the ecological processes in their environment. In other words, researchers ask, 'How do organisms survive in their environments?' As a study that starts from the fundamental physiological standpoint, his focus on plant behavior, resources and interaction, will add a new lens to understanding coexistence among plants. Upon completion of his research, Jacob hopes to offer insight on how plants coexist in nature and how competition for water affects species invasions.



Photo of Jacob Levine's test plots awaiting rain

This article was written by UCSB undergraduate Cynthia Sanchez as part of a communications course. Thank you, Cynthia!

The Science Behind Wildflower Blooms



Each spring, wildflowers spring up from the earth in a patchwork of colors and forms that feel almost magical: Where a few short months earlier seas of golden invasive grasses dominated, winter rain brings an eruption of life that E.O. Wilson himself would be pleased with. In the Santa Ynez Valley, we are far from experiencing a super bloom this year, but the emergence of

spring got us thinking about wildflower blooms and what ingredients lead to 'good' wildflower years. In short, timing is everything. More than just the previous winter's rain, good bloom years depend on multi-year cycles. The science of a super bloom is complex, but here are a few important ingredients:

- **Precipitation cycles:** Wildflower blooms tend to be biggest in the first rainy season after an extended drought. One reason is that drought puts pressure on herbivores, causing their numbers to decline. A rainy year after extended drought presents the perfect opportunity for wildflowers to rebound before herbivory pressures increase.
- **Temperature cycles:** A slow warming period is important for many of our native wildflowers to germinate and bloom before native grasses take hold.
- **Fire cycles:** Wildflowers abound in the wake of moderate (not mega) fires. One reason is that many seeds exhibit what is known as dormancy, meaning that the seeds have ample water, oxygen, and

temperature but will not grow until there is a special event or occurrence that triggers their germination. Some seeds need events such as fire or flood to break the seed coat and allow the plant to be able to grow. If you have ever soaked or scratched a seed to get it to germinate, you have worked with dormancy.

- **Quiescence:** Quiescence is when a seed does not sprout because it does not have the right conditions for growth. This is the basic way that seeds await warmth or rain before germinating. Many of our native annuals and short-lived perennials have to be pretty good at producing seeds that can survive for long stretches of time before conditions are right for blooming.

The interactions between seeds and their environment speak to the complex ways native plants are adapted to survive in our local ecology. All the ingredients of bloom cycles makes us appreciate and look forward to a super bloom year even more!



Lupines, such as this Sky Lupine (*Lupinus sericeus*) are a common sight across California grasslands. Their seeds have a hard coat that must be broken down through scarification or heat before germinating.



California poppies (*Eschscholzia californica*) bloom most prolifically in a wet year immediately following a drought. Poppies also bloom prolifically after a fire. Some flowers are fire followers. Some flowers are drought followers. Poppies are both.



The Fremont star lily (*Toxicoscordion fremontii*), also known as a deathcama, has a large bulb similar to a tulip or a potato. These bulbs hold energy and water allow the plant to survive long periods with unfavorable conditions. Blooms of these perennial plants are frequently seen after fires, but do best when fire frequency is not too high. Studies have suggested that star lily need ample years between fires to store resources.

Some seeds have a long delay between being planted in good conditions and germinating. Blue-eyed grass (*Sisyrinchium bellum*) for example, can take four to six weeks to germinate. Evolutionarily, this helps ensure that all the seeds do not sprout at the same time, making the population less vulnerable to a serious weather event or overcrowding.

New Wildlife Camera Project at Sedgwick



Sedgwick Faculty Advisor Chandra Krintz demonstrating how to install a wildlife camera for project participants.

In an effort to hone our camera trapping and data processing skills, and see how useful cameras are in documenting the prevalence of wild pigs at Sedgwick, UC Santa Barbara faculty, Sedgwick staff and La Kretz Center researchers teamed up this winter to start a new research project we're calling "Here Piggy Piggy". Seventeen wildlife cameras have been deployed within a mile of the field station to capture images of our least charismatic megafauna, wild pigs, over the next few months. In fall, cameras will be redeployed in the SW corner of the reserve to collect baseline data on wildlife using coastal sage scrub communities inside and outside the prescribed burns being planned starting in 2022.



BONE CANYON

A wild boar caught on a Sedgwick wildlife camera in February 2021

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