

*at Joshua Tree National Park*

74485 National Park Dr. Twentynine Palms, CA 92277  
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## Mosses in Motion: Desert Moss Ecology & Diversity

### Information

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Date/ Time: Saturday, March 12, 9 am – 5 pm  
Sunday, March 13, 9 am – 4 pm  
Meet at: [Oasis Visitor Center](#) (click on link for a map of the meeting site)  
74485 National Park Dr., Twentynine Palms, CA 92277  
Instructor: Theresa Clark, PhD, Biological Sciences

### Overview

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Moss in the desert? Why yes! Come learn the many important roles mosses play in desert ecosystems! This introductory course will introduce students to this mysterious and beautiful group of tiny, overlooked plants, which have the resiliency to survive most of the year dry and dormant! Students will learn about this adaptation for “drying without dying” in desert ecosystems and how moss microhabitats help protect them from extreme desert climate. Students will use microscopes to learn what features (macro & microscopic) define moss evolutionarily and how to distinguish them from commonly confused lichens, algae, ferns, and look-alike herbs. A “Mosses in Motion” hydration activity will teach students the unique “sponge-like” relationship between mosses and water, and how this compares to survival strategies in other desert plants. In the field, students will become keen “moss hunters” gaining first-hand experience with finding and identifying common mosses on rock, soil, biocrust, and riparian areas in the Mojave Desert while learning to differentiate moss from the other tiny spore-producing organisms encountered. Lastly, the field ecology component will teach students to characterize protective features of moss microhabitats and easily quantify how they may help shelter mosses from the brunt of future climate change with a shade app called Sun Seeker©.

### Itinerary

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Saturday, March 12, 9 am – 5 pm

*Oasis Visitor Center*

- Lecture
- Lunch Break, **bring your own lunch!**
- Lab Session with microscopes

Sunday, March 13, 9 am – 4 pm

*Oasis Visitor Center*

- Field session – exploring moss habitats in JTNP
- Lunch in the field, **bring your own bag lunch & water!**
- Field session continued – field collecting tips & tricks

## **What to Bring to the Course**

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### ***Optional Equipment***

- Hiking Poles, knee pads, hand lens (but we will provide LED magnifying glasses)

### ***The 10 Essentials: Every day in the Desert***

- Day pack
- 4 quarts of water
- Hiking boots with traction soles
- Lunch and snacks
- Clothing layers
- Hat
- Sun glasses
- Sunscreen
- Small field notebook and pencil/pen
- Whistle

## **Fitness Requirements**

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Participants must be in good physical condition for courses/activities in a desert that may be hot, dry, windy, and sometimes surprisingly cold.

## **Hiking Level**

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Easy (flat terrain on marked trails with the option to explore boulder fields)

## **Guidelines**

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- You are responsible for your safety.
- Park your car in designated areas only. Parking along the side of the road is dangerous to you and the environment.
- Rattlesnakes are present in the park. Avoid contact with wildlife. Put your hands and feet only where you can see.
- Stay with the group. If you get lost, stay put.
- Drink plenty of water. If you run out, notify the instructor or the Desert Institute Representative.
- Before leaving the class, check out with the Desert Institute Representative.

## **College Credit**

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BIOLOGY X412.1 1 unit credit through the University of California, Riverside Extension.

## Instructor Biography

**THERESA CLARK** is a bryophyte ecologist from Maine, but much of her research has been in the American Southwest studying the tiny and misunderstood dryland mosses (which are a quarter of the size of their mesic Maine relatives). She earned a M.S. at Northern Arizona University studying the diversity and ecology of mosses in Grand Canyon National Park. During her PhD at the University of Nevada, Las Vegas she studied dryland moss survival and the potential for these small mosses to “hide” from climate change in protected microhabitats. During the past year, she helped develop a photographic moss guide for common California mosses. In her present postdoctoral appointment at the University of Minnesota, she is studying long-term resilience in dryland mosses while quantifying their unique “spongey adaptations” for holding water. In the coming year, she will be finishing a moss flora of Grand Staircase Escalante National Monument (Utah). Lastly, she hopes to soon publish a moss field guide teaching others to “moss hunt” in drylands without excessive collecting or disturbance of these delicate desert community members.

## Learn more here (before or after the course)

- ❑ Bryophytes of the Gila Wilderness, New Mexico (species list & images)  
<https://wnmu.edu/academic/nspages/gilafloora/bryophytes.html>
- ❑ Theresa’s Mosses of Grand Canyon (PDF at the bottom of the page):  
<https://www.researchgate.net/profile/Theresa-Clark-3/publications>
- ❑ Common Mosses of Western Oregon and Washington -  
<https://www.wildblueberrymedia.net/store/common-mosses-of-western-oregon-and-washington>
- ❑ Janice Glime’s Moss Ecology Online Book - <https://digitalcommons.mtu.edu/bryophyte-ecology1/>
- ❑ Magical World of Moss Gardening (Annie Martin) - [https://www.amazon.com/Magical-World-Moss-Gardening/dp/1604695609/ref=sr\\_1\\_1?](https://www.amazon.com/Magical-World-Moss-Gardening/dp/1604695609/ref=sr_1_1?)

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\* The Desert Institute staff/instructors will attempt to accommodate participants’ needs; however we reserve the right to deny a student participation in the course due to concerns regarding health and safety issues.