

## Biocrust Wonder Walk (Intro to Biological Soil Crusts)

### Information

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Date/ Time: Monday, February 20, 9 am – 1 pm

Meeting location: Joshua Tree National Park Visitor Center

Instructor: Theresa Clark, M.S., Ph.D. Biological Sciences

### Overview

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The desert floor may look like dirt and sand from afar, but with a trained eye and magnifying lens, you can find it covered by beautiful, tiny organisms composing biological soil crust communities vital to the desert ecosystem! Living in the upper inch of the soil surface, these “biocrust” communities include mosses, lichens, blue-green algae, green algae, water bears, diatoms, and bacteria, among other invertebrates. In this field walk, participants will view the secret life of these intricate organisms through hand and magnifying lenses as Theresa discusses how to distinguish the different organismal groups and types of biocrust, highlighting their unique ecological roles in desert ecosystems. She will show participants how to help monitor biocrust presence, diversity, and disturbance using her [iNaturalist Project, “Citizens of the Crust”](#). The monitoring will emphasize zero-impact observations, teaching participants the importance of the National Park Service decree signs, “*Don’t bust the crust!*”

### Itinerary

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#### Monday (President’s Day), Feb 20, 9:00 am – 1:00 pm

- 9 am – meet at JTNP Visitor Center, car caravan to hiking location (JTNP)
- 9:30 – 10 am Introductions, handouts, & magnifying lenses (provided)
- 10 am – 12:30 pm nature walk: how to find & sustainably observe biocrust
- 12:30 pm – travel back to Visitor Center

### What to Bring

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- Notebook and pencil/pen
- Hand lens & magnifying lens (will be provided but if you have one, bring it!)
- Day pack
- Sun protection: Clothing layers, Hat, Sunglasses, Sunscreen
- 2-3 quart water (for half day)
- Closed-toe hiking shoes & knee pads (allows kneeling with less soil disturbance!)
- Lunch and snacks (optional)

## **Activity Level**

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Easy to moderate, but kneeling down to observe the biocrust will be essential! We will be out in the elements walking a couple of miles over the course of a couple hours.

## **Instructor Biography**

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**THERESA CLARK** is a bryophyte ecologist from Maine, but much of her research has been in the American Southwest studying tiny dryland mosses (which are often a quarter of the size of their mesic Maine relatives). She earned a M.S. at Northern Arizona University researching the diversity and community 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. After finishing her degree, she has continued in research and science education. At the University of Minnesota, she has been teaching biology and studying long-term desiccation tolerance and functional trait ecology of dryland mosses including characterizing their unique “spongy adaptations” for holding and moving water. In progress is her moss flora of Grand Staircase Escalante National Monument (Utah) and she has helped develop a photographic moss guide for using California mosses as bioindicators for riparian health. She offers regular moss outreach events, teaching children and adults alike how to “moss hunt” without disturbing these important and sometimes delicate plant communities.

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

## **Suggested Readings**

Technical reference: <http://www.soilcrust.org/crust.pdf>

Field guide: [http://sbsc.wr.usgs.gov/products/pdfs/Field\\_Guide\\_Book\\_25.pdf](http://sbsc.wr.usgs.gov/products/pdfs/Field_Guide_Book_25.pdf)

Theresa’s Website (includes biocrust images): <https://theresaannclark.wixsite.com/mossesinmotion>