

Life on the Edge: Extreme Environments | Swaner EcoCenter

01/09/2026

Utah is home to a plethora of unique habitats and ecosystems, some of which create especially challenging conditions for survival! Many organisms in Utah depend on special adaptations to help them survive and even thrive in these extreme environments.

From snowy mountain peaks to dry deserts and the Great Salt Lake – let's explore some of these organisms who live their life on the edge.

Snow Algae

These often colorful, cold-loving algae thrive at low temperatures with high amounts of light. Their specialized cellular adaptations allow them to survive in the extreme environments of Utah's mountain snowfields. These algal blooms usually start when there is enough meltwater in the snowpack, often in the spring and early summer. Sometimes called "watermelon snow", the algae can turn the surface of the snow a pink, red, orange, or even green color.

Researchers at USU are working to better understand snow algae, how it impacts the reflective properties of snow, and how climate change impacts it.

Cryptobiotic Soil Crusts

These dark, bumpy "living soils" thrive in Utah's dry deserts, where intense sun, limited water, and shifting sands create harsh conditions for life. Made of cyanobacteria, mosses, lichens, and fungi, cryptobiotic crusts lock the soil together with tiny filaments that act like nature's rebar. Their slow-growing communities stabilize dunes, store nutrients, and help desert plants take root.

These fragile, living surface layers on desert soils can take decades—or even centuries—to recover once crushed by footsteps, tires, or livestock. Research into how cryptobiotic crusts cycle nutrients, support desert ecosystems, and respond to a warming climate can help us better understand success in extreme desert environments.

Brine Shrimp

These tiny, salt-loving crustaceans thrive in the extreme waters of the Great Salt Lake, one of the saltiest large lakes in the world (*2 – 9 times saltier than the ocean!*). Brine shrimps are perfectly adapted to high salinity, using specialized gills and hardy life cycles to survive where most other animals cannot. When conditions are right, they can give birth to live young, or when conditions are more extreme, they lay cysts - dormant eggs that can withstand drying, freezing, and intense salinity that hatch when the ideal conditions return.

Though small, brine shrimp are a powerhouse of the lake's ecosystem. They graze on algae, recycle nutrients, and serve as an essential food source for millions of migratory birds that rely on the Great Salt Lake as a critical stopover. Research at the lake by the Great Salt Lake Institute is even being used to help model where life might exist on Mars!

Want to learn more about extreme environments on Earth and even how they help us understand possibilities for life in space? Visit Swaner's newest temporary exhibition [*Life on the Edge*](#) at the EcoCenter opening January 24 and on display through May 10!



From top left image to bottom right: USU Researchers studying snow algae (photo by Joe Giersch), Green plant germinating on the biological soil crust (Canyonlands National Park, UT), Brine shrimp, Visitors to Life on the Edge learning how microbes contribute to nutrient cycling by using a movable video microscope (Sciencenter)

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"Article thumbnail"); } }; }); // Closes the IIFE
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Location, Hours & Contact

Physical & Mailing Address

[1258 Center Drive](#)
[Park City, Utah 84098](#)

EcoCenter Hours

Wednesday – Sunday, 10 am – 4 pm

*The EcoCenter will be closed on Wednesday, October 7 and Thursday,
October 8.*

Email

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[Directions, Parking, & Transit View Staff Directory](#)

- [Swaner EcoCenter Facebook page](#)
- [Swaner EcoCenter Instagram page](#)

Events

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