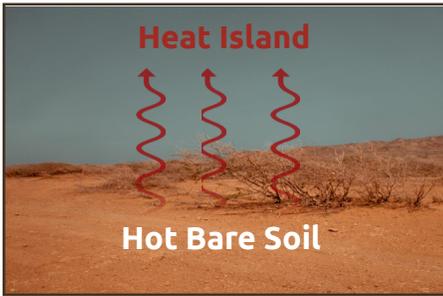


PLANTS COOL and REHYDRATE the PLANET

Bare Ground Causes Drought

“It’s not drought that causes bare ground, it’s bare ground that causes droughts.”

~ Allan Savory



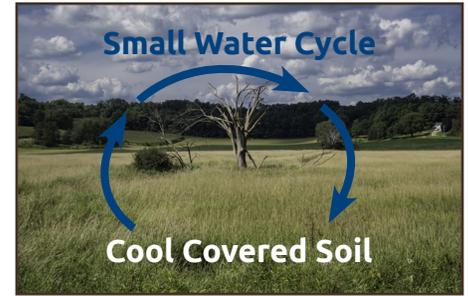
Radiant Heat

Bare soil heats to extremely high temperatures and re-radiates heat energy, similar to the effect felt near roads. This heat energy increases exponentially as temperature rises; it is proportional to the fourth power of temperature (T^4 or $TxTxTxT$). The intense radiant heat creates a high-pressure heat island that pushes low-pressure moisture systems away. This process affects the water cycle and perpetuates hot, dry conditions.



No Living Soil Structure

Disturbed or compacted soil, exposed by tilling or altered in other ways, loses the cohesive sponge-like structure created by plant roots and soil microorganisms. Moisture evaporates from bare soil very quickly, leaving a dessicated surface that repels water and creates dust. Dust particles in the air attract water vapor, but cannot coalesce it into large enough drops to form rain. This results in humid haze that holds heat and limits cooling.



Water is Retained

As plants transpire, they release moisture slowly and more consistently than bare soil. They emit natural aerosols and beneficial bacteria that create humidity and influence the formation of clouds and regional rain cycles. Through photosynthesis, plants feed soil microorganisms. These microbes create a soil sponge that absorbs, holds, and filters water. These processes create low-pressure zones that aid the inflow of other moisture.

Plants Cool - Bare Soil Heats

Vegetative cover significantly reduces radiant heat, dust emissions, and humid haze. In addition to natural shading, plants have a cooling effect through photosynthesis. Plants and soil microorganisms also help retain soil moisture.



Finian Makepeace, co-founder of Kiss the Ground, illustrates the temperature extremes between vegetation and bare ground. Recording temperatures on a mild day in California, he discovered that the sun-baked soil was 78.5°F higher than leaf temperature. Under these hot, dry conditions beneficial microbes in the soil cease to function effectively. This lifeless soil remains parched as water runs off, compounding the heat-island effect. It increases drought cycles and turns fertile land to desert.

Biologically active soil with vegetative cover allows water to infiltrate rapidly. This living soil sponge reduces flooding, increases resilience to drought and wildfires, and improves water availability and quality. Land management practices that minimize bare soil will improve natural water cycling and reduce global heat dynamics.

Actions

Apply soil health principles that build biologically active soil:

- maintain diverse plant cover
- minimize soil disturbance and compaction

Support farmers and ranchers who practice these principles.