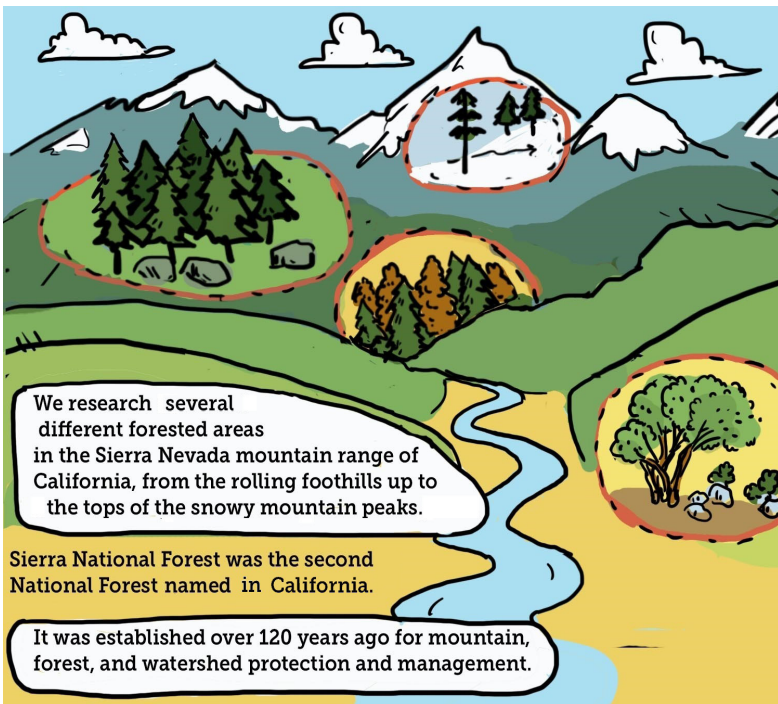
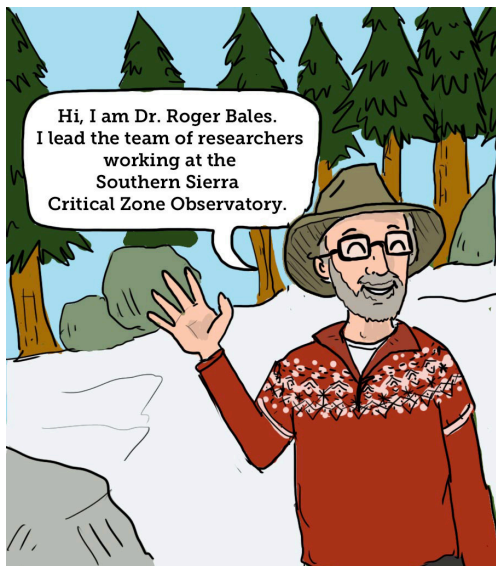





a comic about
our research program

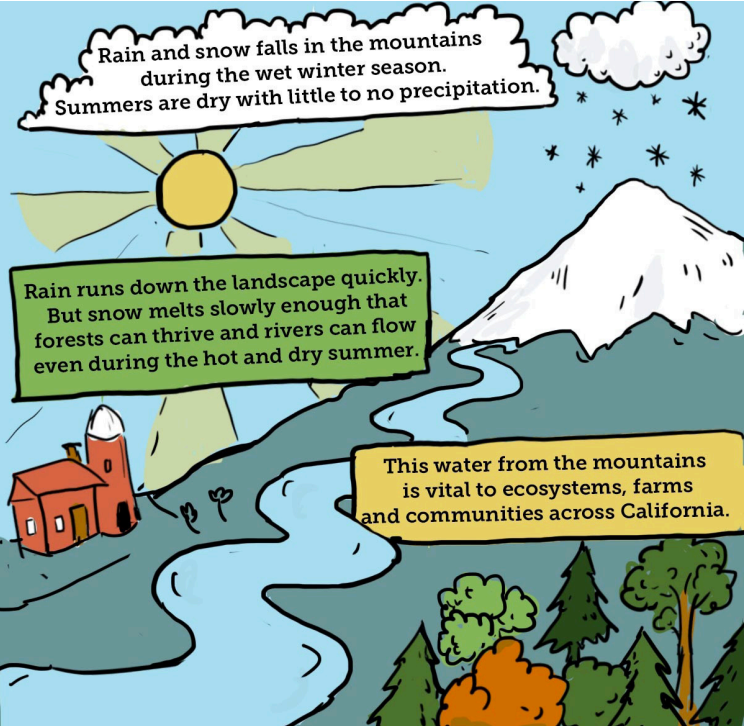


learn more on
criticalzone.org/sierra





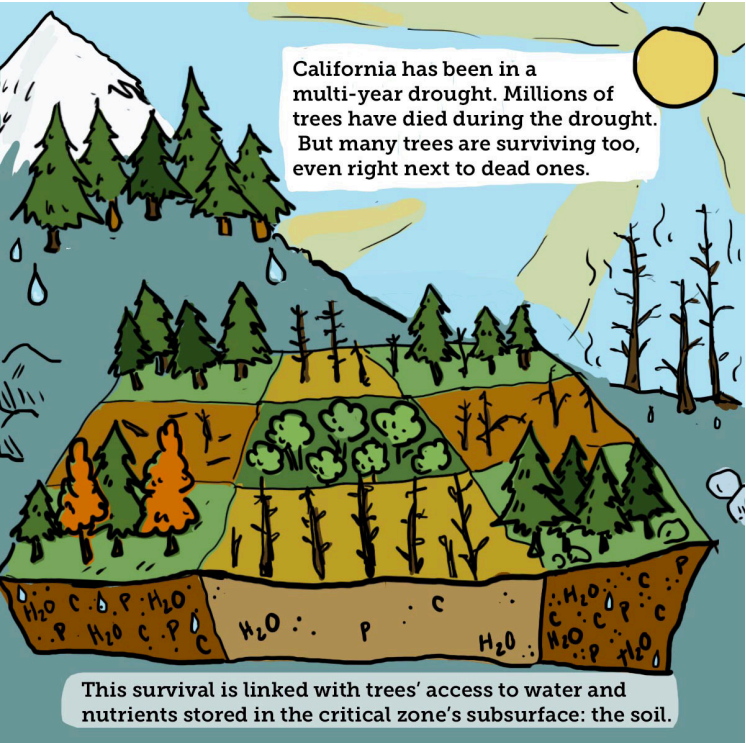
Sierra Nevada is Spanish for "snow-covered mountain range". Snow and its interactions with the critical zone are very important for California's ecosystems and society.



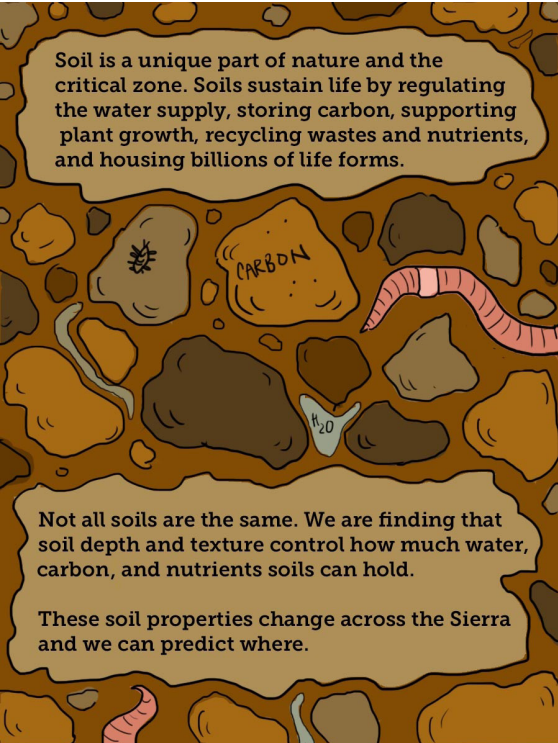
Rain and snow falls in the mountains during the wet winter season. Summers are dry with little to no precipitation.

Rain runs down the landscape quickly. But snow melts slowly enough that forests can thrive and rivers can flow even during the hot and dry summer.

This water from the mountains is vital to ecosystems, farms and communities across California.



California has been in a multi-year drought. Millions of trees have died during the drought. But many trees are surviving too, even right next to dead ones.



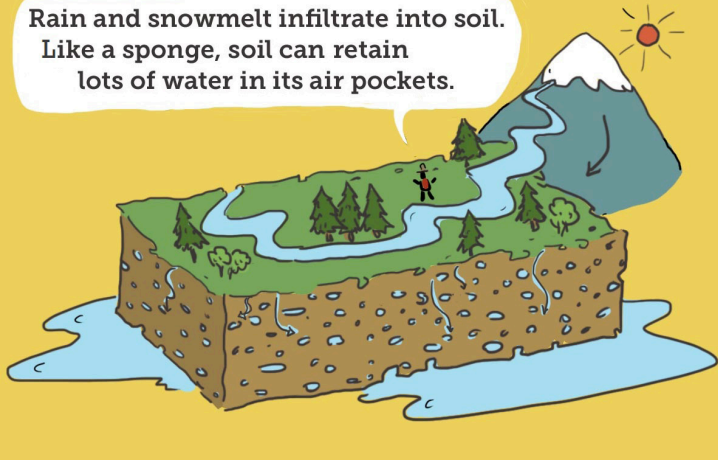
Soil is a unique part of nature and the critical zone. Soils sustain life by regulating the water supply, storing carbon, supporting plant growth, recycling wastes and nutrients, and housing billions of life forms.

Not all soils are the same. We are finding that soil depth and texture control how much water, carbon, and nutrients soils can hold.

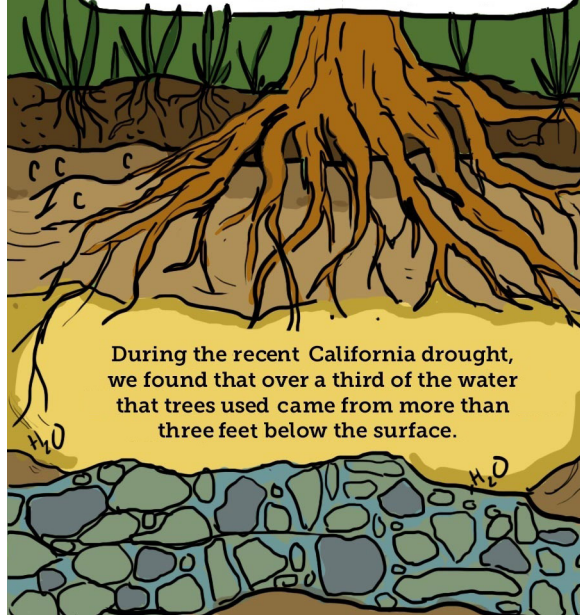
These soil properties change across the Sierra and we can predict where.

This survival is linked with trees' access to water and nutrients stored in the critical zone's subsurface: the soil.

Rain and snowmelt infiltrate into soil.
Like a sponge, soil can retain
lots of water in its air pockets.



Trees need water year-round, but it does not rain
enough in summer and fall for trees to survive on
just precipitation. Trees depend on water stored
deep in the soil during dry seasons and drought.

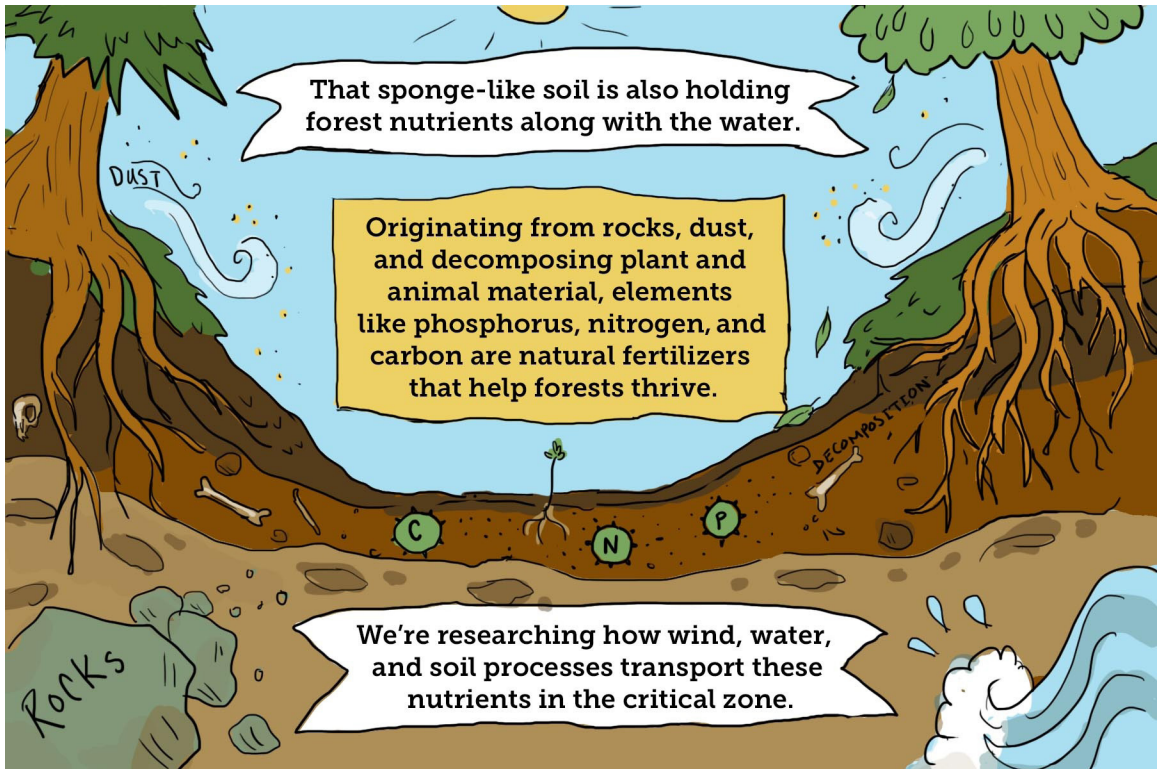


During the recent California drought,
we found that over a third of the water
that trees used came from more than
three feet below the surface.

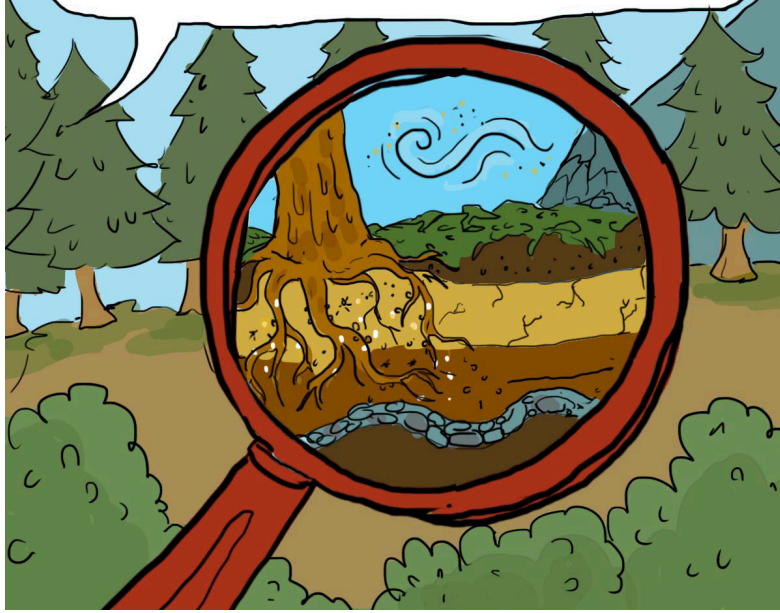
That sponge-like soil is also holding
forest nutrients along with the water.

Originating from rocks, dust,
and decomposing plant and
animal material, elements
like phosphorus, nitrogen, and
carbon are natural fertilizers
that help forests thrive.

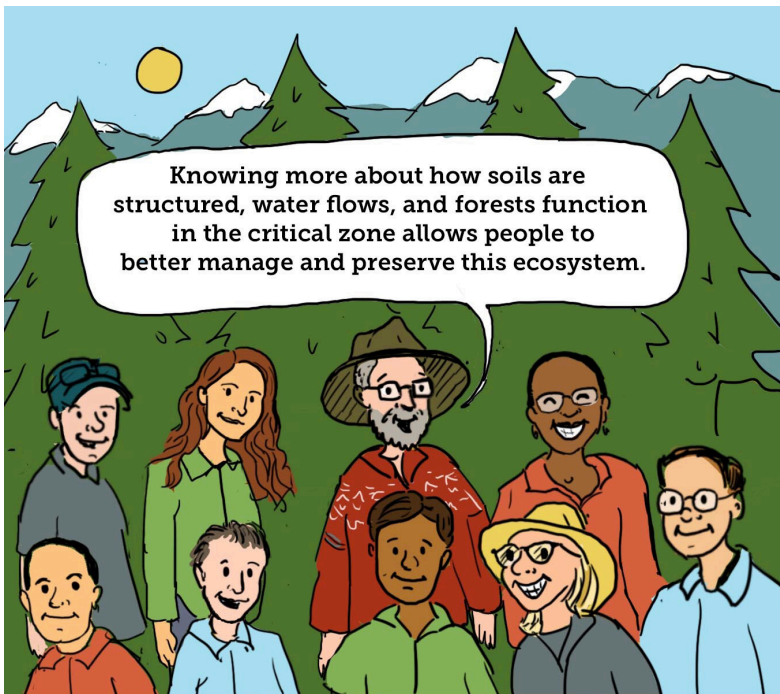
We're researching how wind, water,
and soil processes transport these
nutrients in the critical zone.



We're studying the forest and its plants, microbes, soils, rocks, and water to understand how the properties and processes of the critical zone can impact a tree's survival and a forest's health.



Knowing more about how soils are structured, water flows, and forests function in the critical zone allows people to better manage and preserve this ecosystem.



our critical zone research leaders