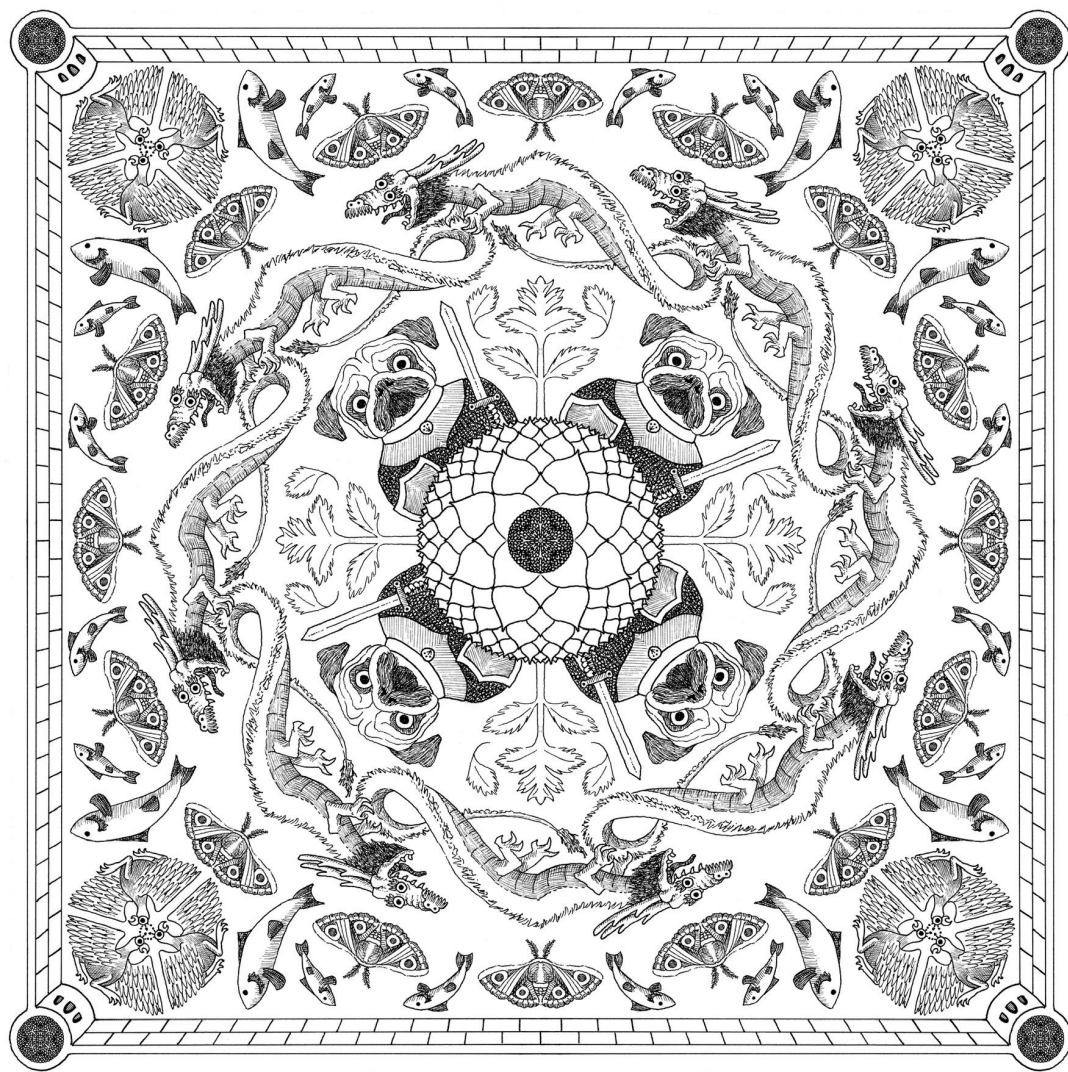


MASTERCLASS

REHYDRATION - FROM SOIL TO WATERSHED

MIMI CASTEEL, HOPE WELL WINE
BROCK DOLMAN, OCCIDENTAL ARTS &
ECOLOGY CENTER





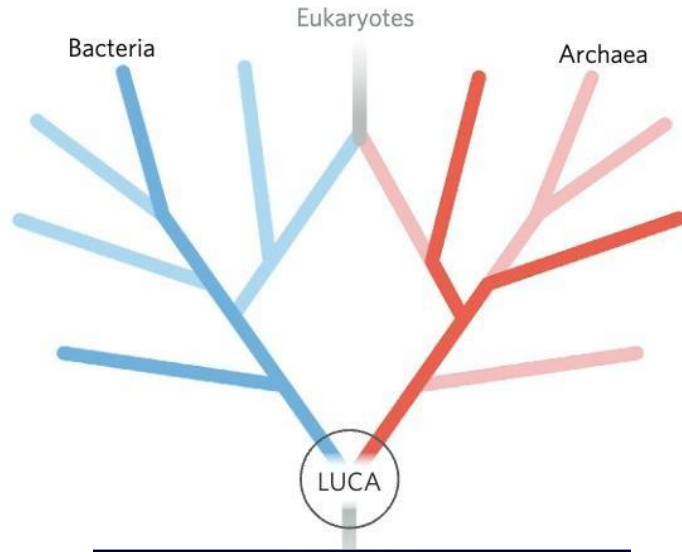
Reincarnation

*Mindset Symposium
June 2026*

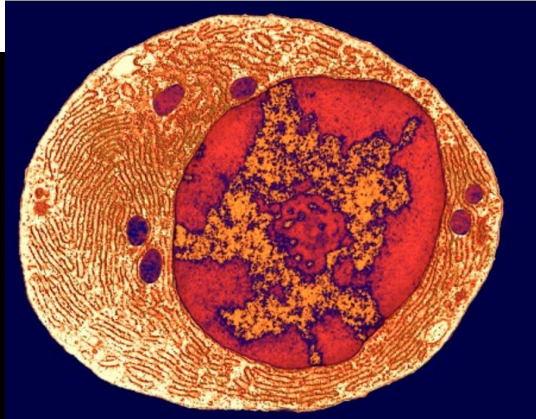
In every work of art the subject is primordial, whether the artist knows it or not. The measure of the formal qualities is only a sign of the measure of the artist's obsession with his subject; the form is always in proportion to the obsession.



~Alberto Giacometti



LUCA

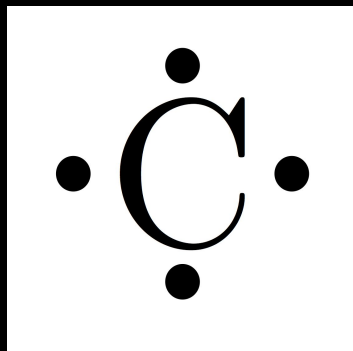


*Image / figure: *Nature Microbiology*, Weiss, M., Sousa, F., Mrnjavac, N. *et al.* The physiology and habitat of the last universal common ancestor. *Nat Microbiol* **1**, 16116 (2016).

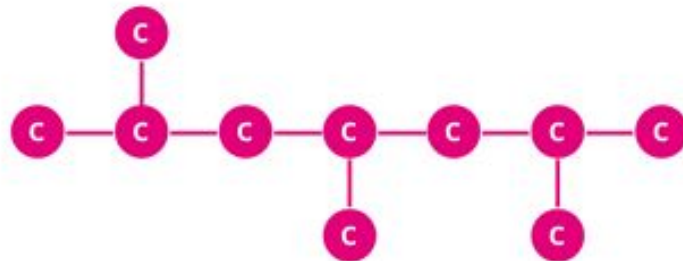
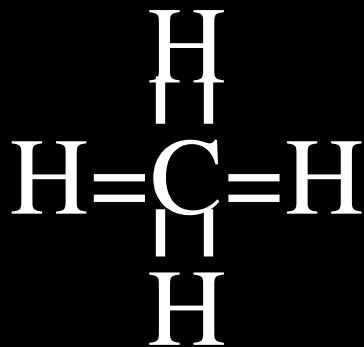
<https://doi.org/10.1038/nmicrobiol.2016.116>

Image by Tobias
Stierli/NCCR PlanetS





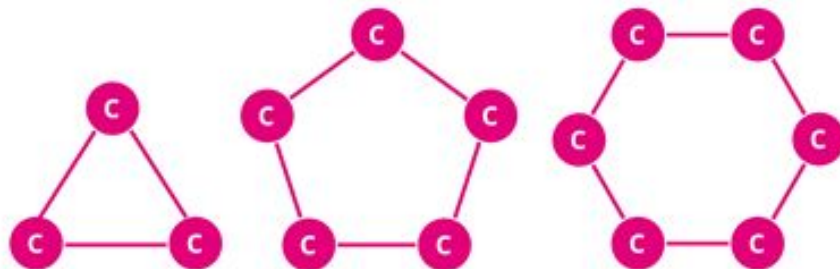
Carbon



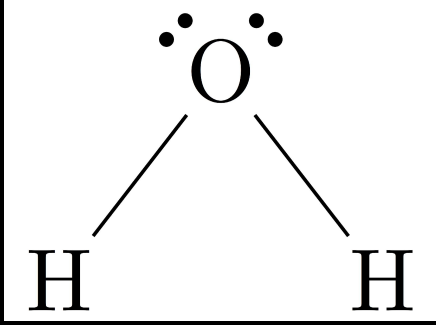
Branched Chain



Linear Chain

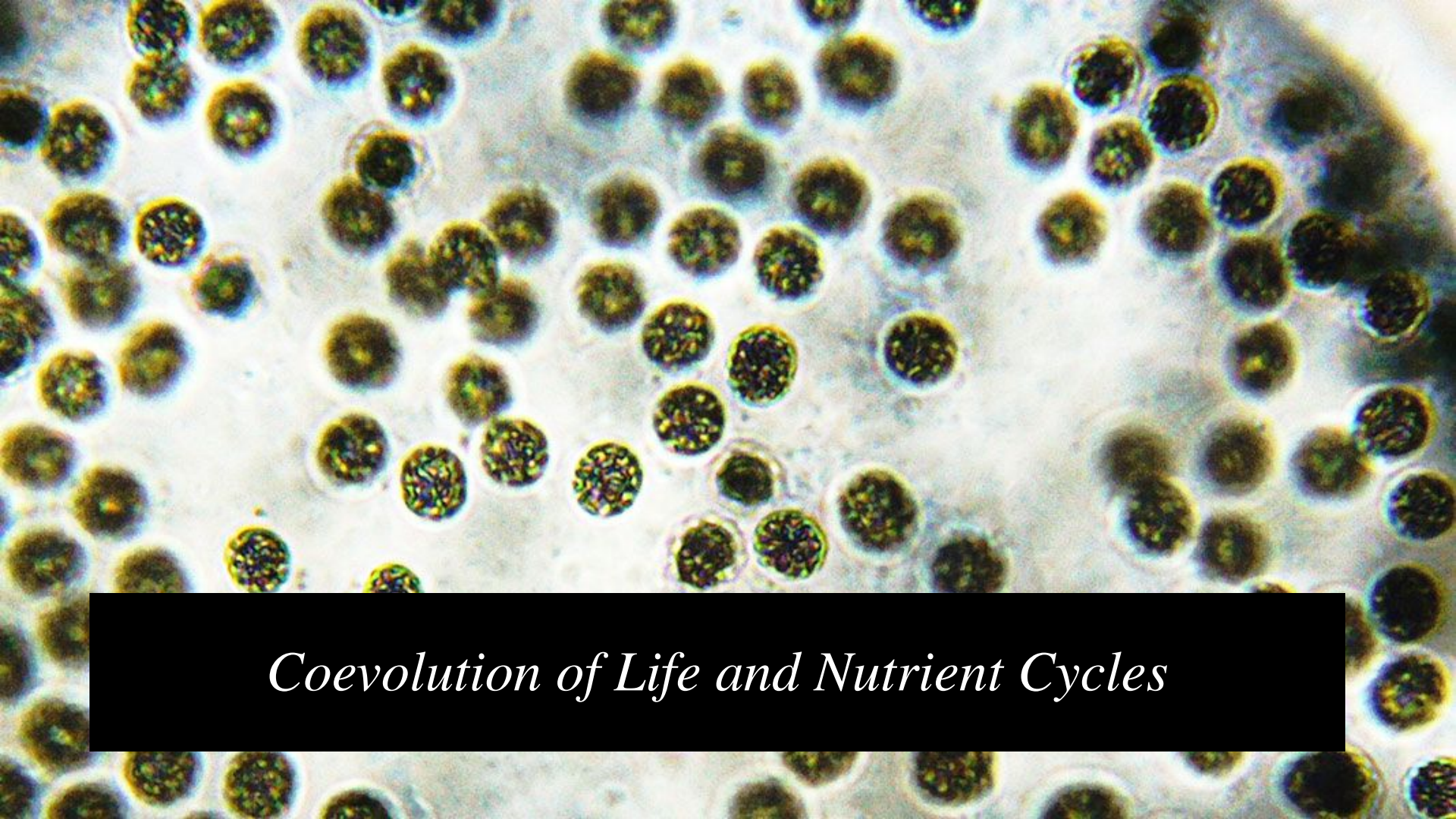


Ring Chain



Water





Coevolution of Life and Nutrient Cycles

Eon	Era	Period	MYA	Emergence	Flourished	Oxygen	Climate	Continental drift
Phanerozoic	Cenozoic	Quaternary	2.6	chimpanzees <i>Homo sapiens</i>				
		Tertiary	65.5	hominins apes primates	mammals			
	Mesozoic	Cretaceous	145.5	angiosperms	dinosaurs angiosperms			
		Jurassic	200	placental mammals bird-like reptiles	gymnosperms			Pangaea rifts
		Triassic	251	mammals dinosaurs	ammonites			
	Paleozoic	Permian	299	basidiomycete fungi	trilobites (arthropoda) insects			
		Carboniferous	359	amniotes	seedless vascular plants			Pangaea forms
		Devonian	416	seed plants/plants with leaves tetrapods lichens and ferns vascular plants insects <u>ascomycete fungi</u>				
		Silurian	434	bony fish				
		Ordovician	488	mycorrhizal fungi cartilaginous fish land plants bryozoans	arthropods move to land			
		Cambrian	542	echinoderms arthropods mollusks vertebrates	arthropods			
	Proterozoic		2500	multicellular animals multicellular algae unicellular eukaryotes	multicellular marine organisms	banded iron formations		
Archaean			4000	cyanobacteria photosynthetic bacteria unicellular organisms				
Hadean			4600	earliest life traces (?)				

Last ice age

California: Last major uplift

Mass Extinction #5

California: Farralon plate subduction

Mass Extinction #4

Mass Extinction #3

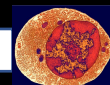
First soils forming on terrestrial earth

Mass Extinction #2

Mass Extinction #1

Death valley rocks

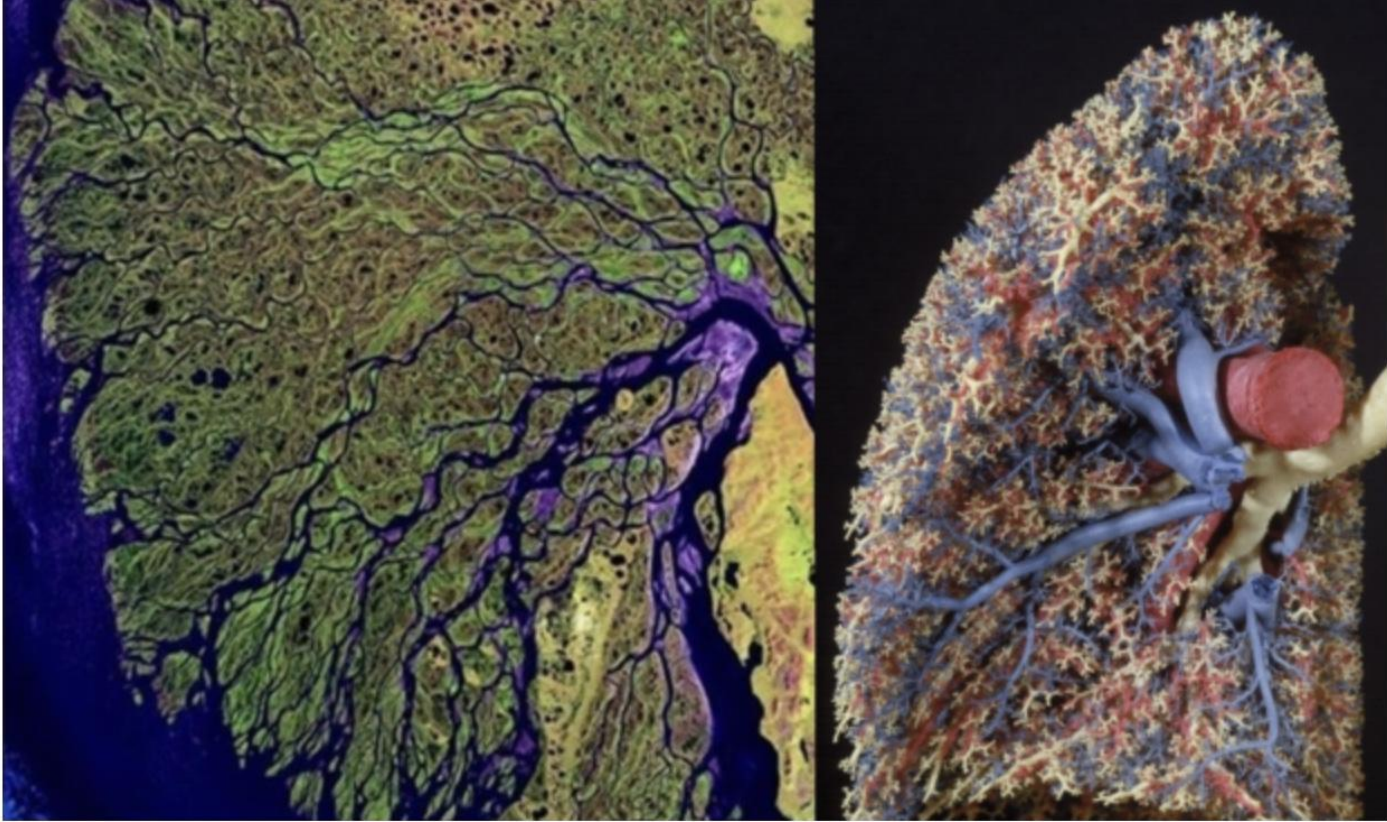
LUCA



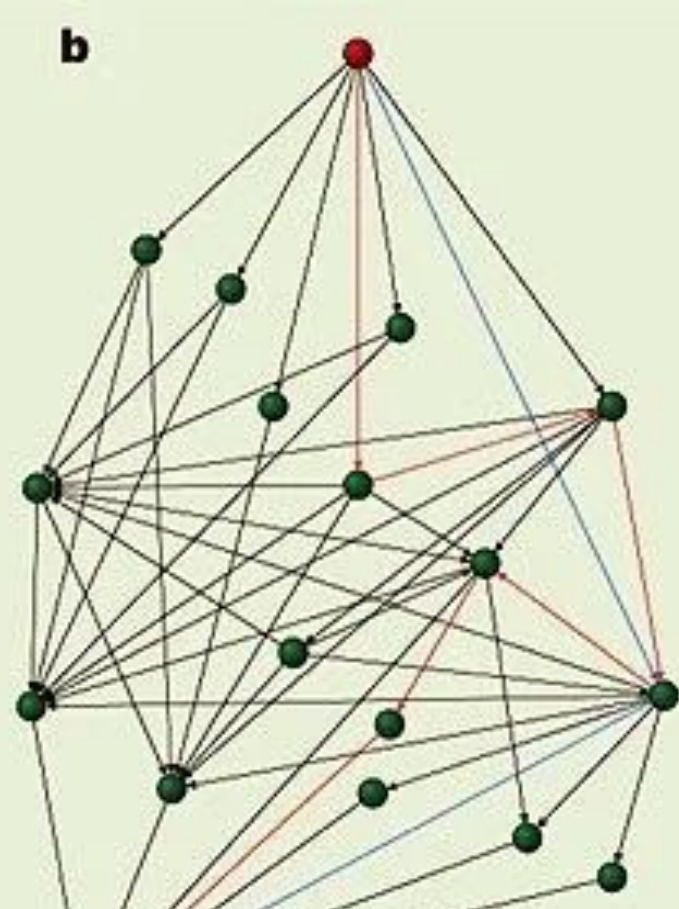
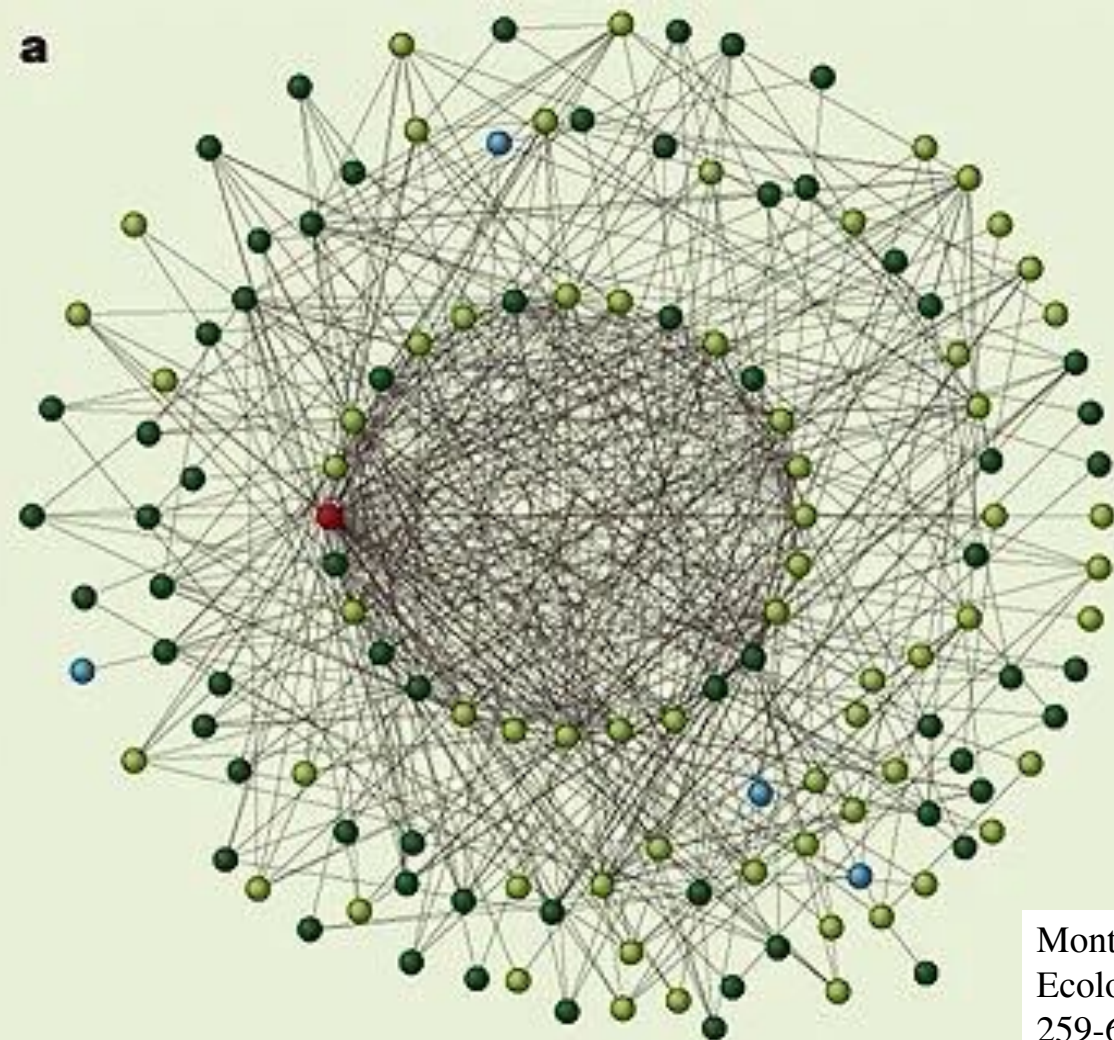


Mark Hallett, mural, *The Treasures of the Tar Pit*





Flow systems in action: the delta of the Lena River in northern Siberia (left) and a cast of a human lung (right). (A. Bejan/Doubleday)



Montoya, Jose & Pimm, Stuart & Sole, Ricard. (2006).
Ecological networks and their fragility. *Nature*. 442.
259-64. [10.1038/nature04927](https://doi.org/10.1038/nature04927).



Marlin Harms, CNPS website



Zaya Akulova,
Purple needlegrass, *Stipa pulchra*



Jim Richardson,
Root demo, United States Botanical Garden



San Francisco Chronicle



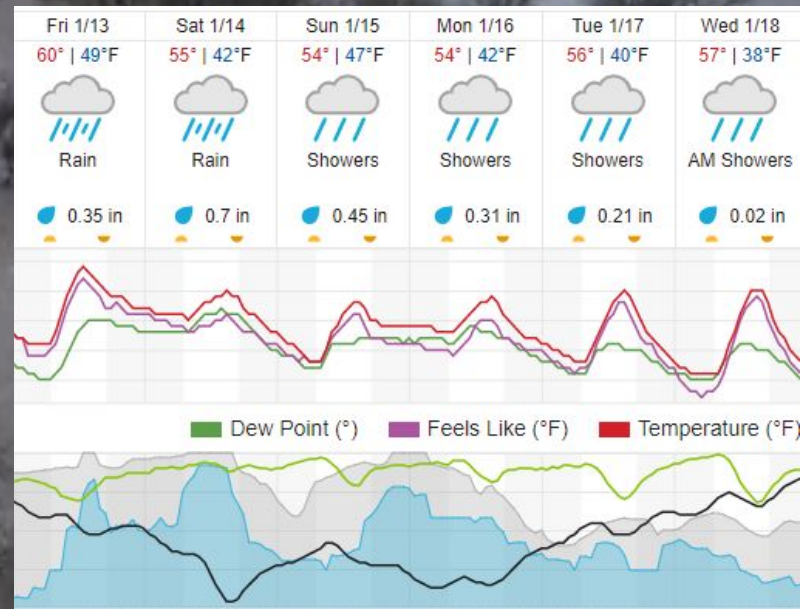
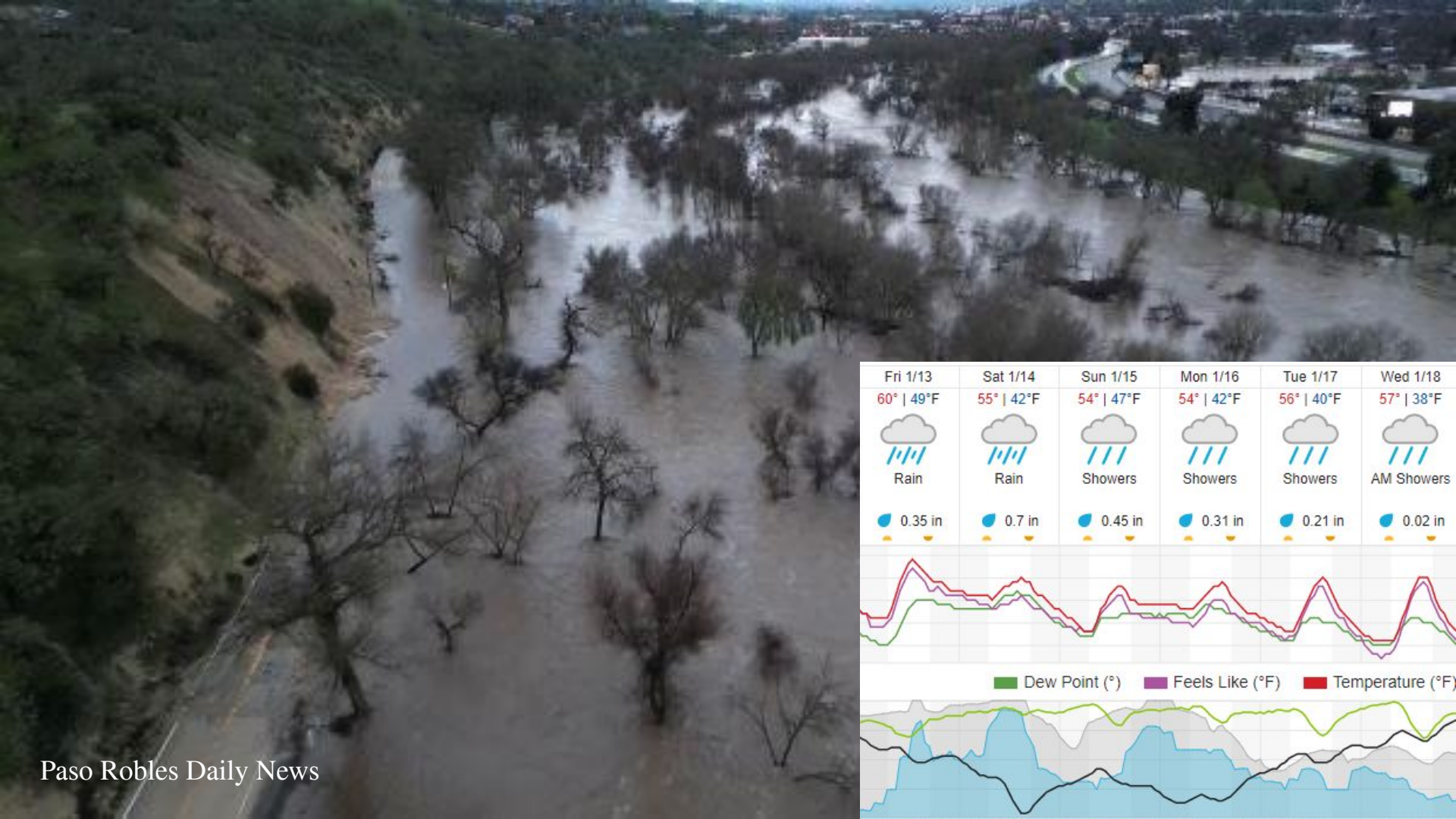
Heat Dome, June 2021, 5 p.m.



Uncovered soils,
Fenceline neighbor,
Elevation 338'
150°F

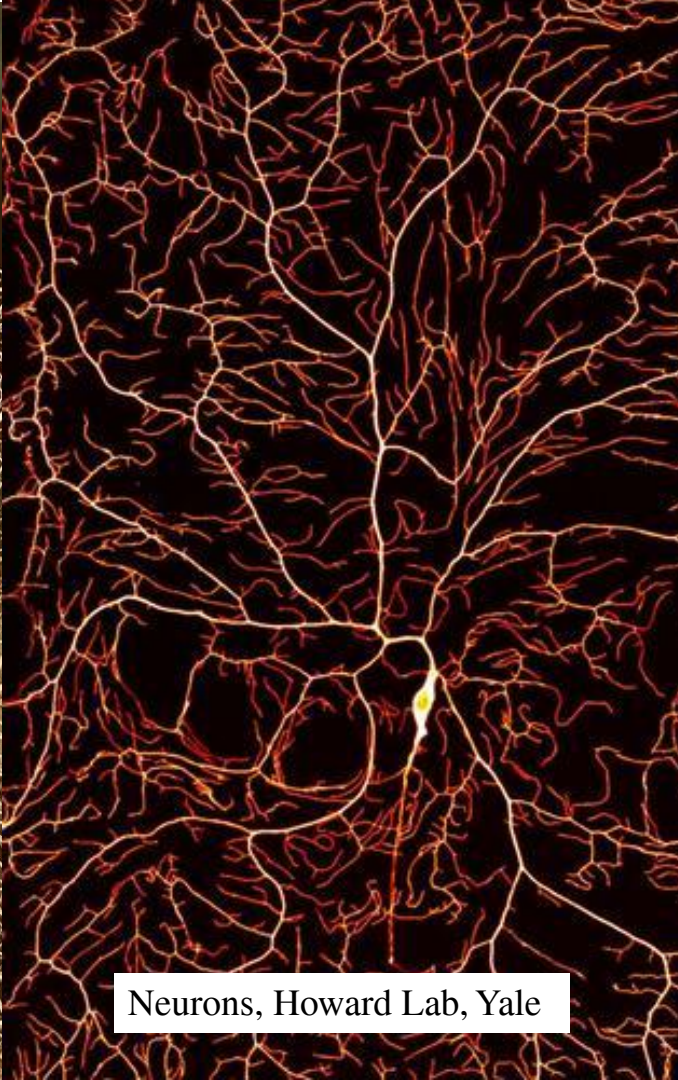


Covered soils
Hope Well,
Elevation 350'
89°F





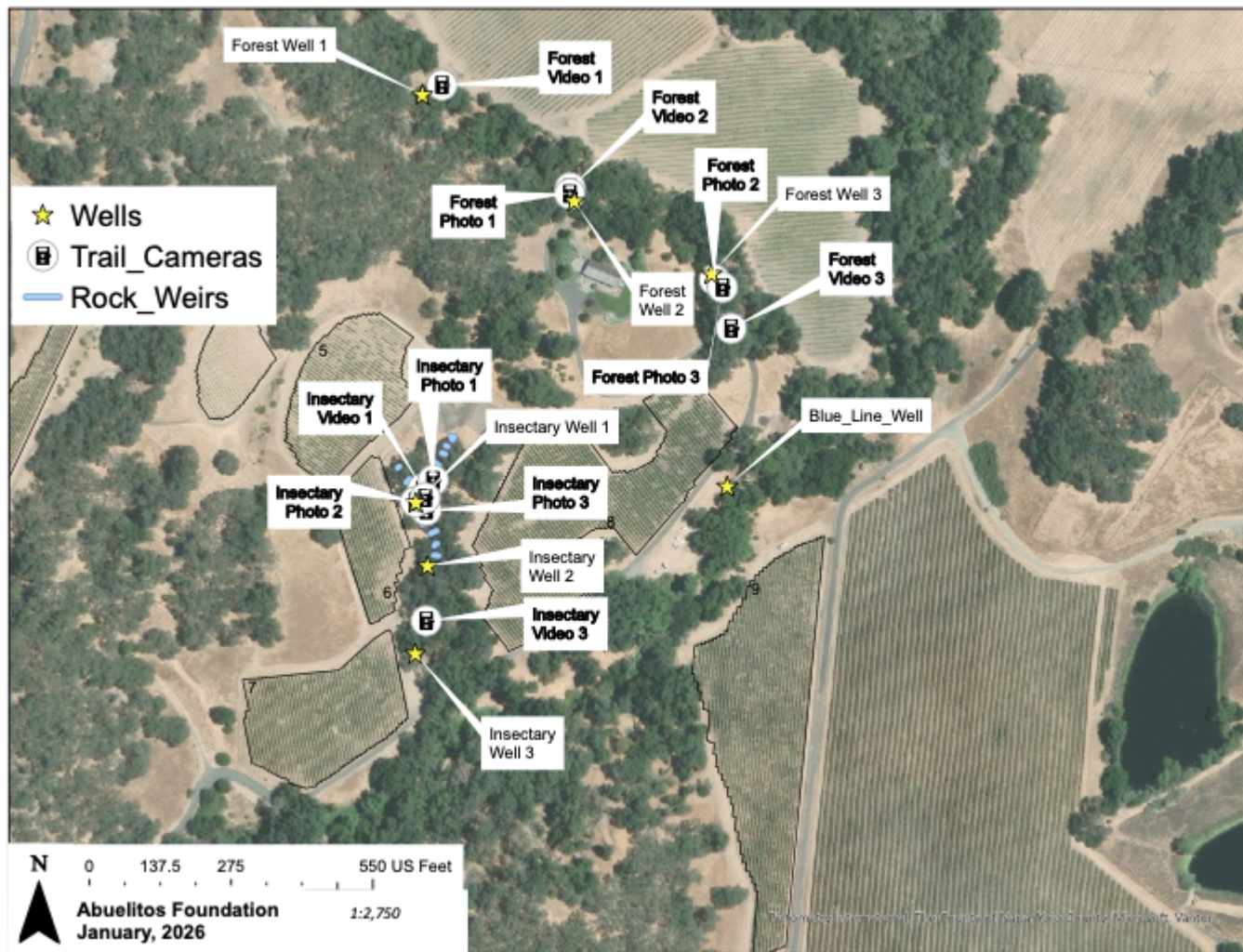
Alder leaf, Mimi's Farm



Neurons, Howard Lab, Yale

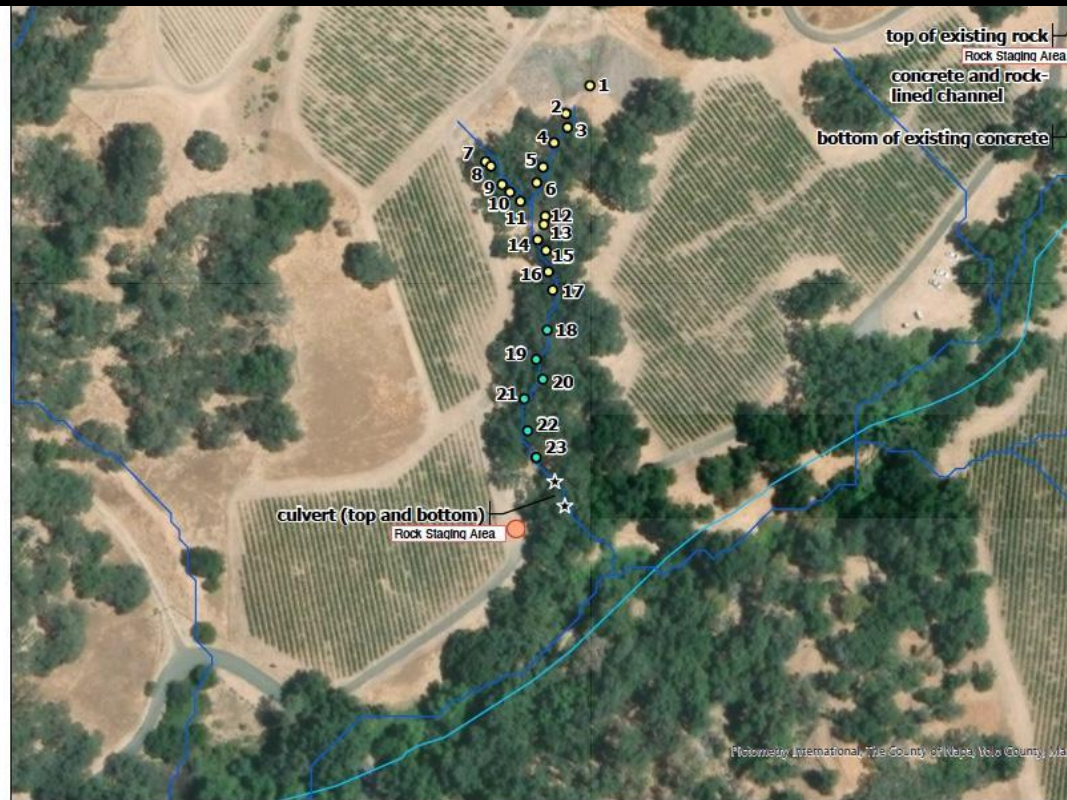
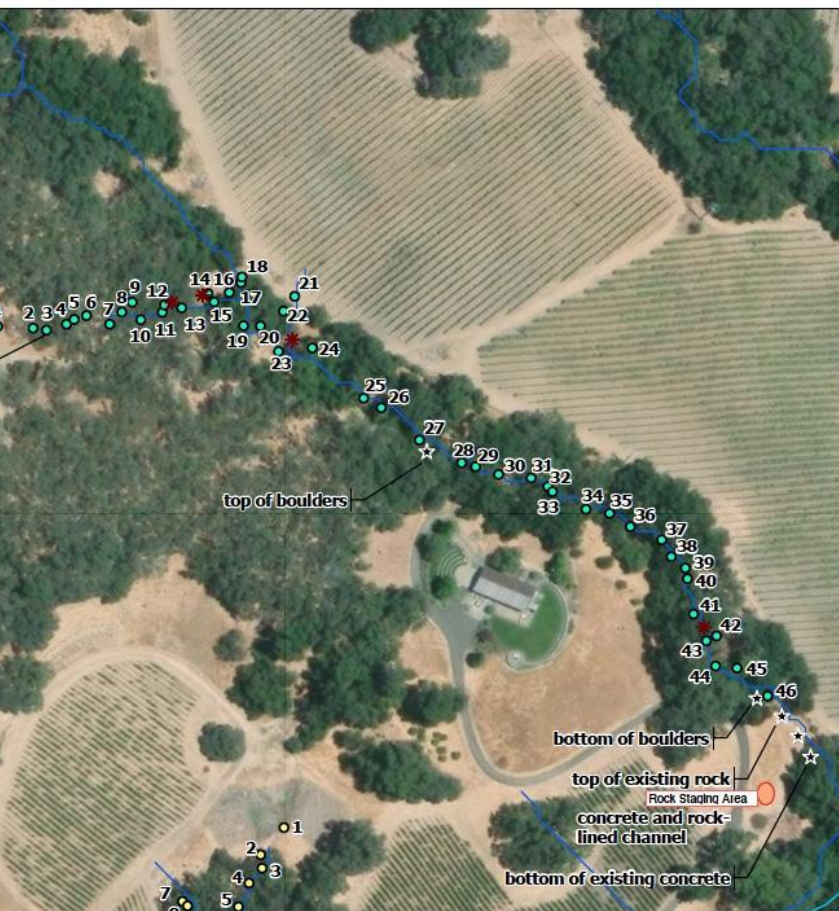


Rakaia River, New Zealand



Map of existing and planned rock structures

Date: 9/25/2025



Legend

- Existing rock structures
- Planned structures
- ★ Top of Brushpack
- ★ Infrastructure

Prepared with assistance from the USDA Natural Resources Conservation Service

0 125 250

Scale: 1:2,000





