





Rock, Water, and Wind

Konza researchers + Kaw (Kaáⁿze) language
Joint perspectives on People & Land discussion part 2, 230519



Introduce Lydia, Charlee, Rissa

Participants please write your name, email, and primary interests in the Chat

Questions: will have open discussion at the end, post questions in the Chat as we go

Land and Name Acknowledgement

The grasslands on which Konza Prairie LTER research is focused have been a home to people for thousands of years, including many named and unnamed peoples who lived and hunted here prior to European settlement. Indigenous people of the Kaw (Kanza) Nation inhabited and stewarded this area until their forced removal between 1846 and 1872, when they were relocated to a small reservation in what is now Oklahoma. The depopulated Kaw land was subsequently used to finance the Land-Grant University system under the Morrill Act of 1862, including Kansas State University, which administers the Konza Prairie LTER Program. Our LTER research program operates under a name, “Konza”, that is derived from the name of the Kaw, or “Kaá’ze”, People.

The Konza Prairie LTER acknowledges the immemorial connection of Indigenous peoples with these lands, and we pledge to respect and honor the past and current legacy, cultural history, and knowledge of the Kaw Nation. Through our professional capacity as scientists and educators, we will work to increase our knowledge of the human legacy of these lands, and in turn, will teach this history to others. The beauty of this land inspires our work to understand the tallgrass prairie and support conservation of this ecosystem. However, this inspiration also serves as a reminder of the Indigenous human history that has shaped the modern landscape, and the influence that our current actions will have on the prairie of the future.

<http://lter.konza.ksu.edu/konza-prairie-lter-land-and-name-acknowledgement>



Perspectives & Methodologies

- Understand scientific method and Indigenous perspective on prairie knowledge
- Consider humans' relationship with the Land in North America:
 - This was not "*Terra nullius*" (nobody's land) when Europeans arrived
- Establish a forward-thinking mindset, with an honest vision of the past and present



May 19: Rock, Water, and Wind

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- The concepts of rock, water, and wind are foundational to the Kaw culture and language

Agenda:

13:30-13:35 Introduction / Review

13:35-13:45 Biogeochemistry and stardust; Leopold's *The Odyssey* (Lydia present)

13:45-13:55 Í'n'zhúje'waxóbe - Konza Elder Curtis Kekahbah (Charlee introduce)

13:55-14:00 The Kansa map - Charlee & Lydia

14:00-14:15 Rock, water, wind in Kaw language - Charlee

14:15-14:30+ Questions



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Ecology:

study the interactions between organisms and their environment

Ecosystem ecology:

study the *flow of energy and matter* between organisms and their environment

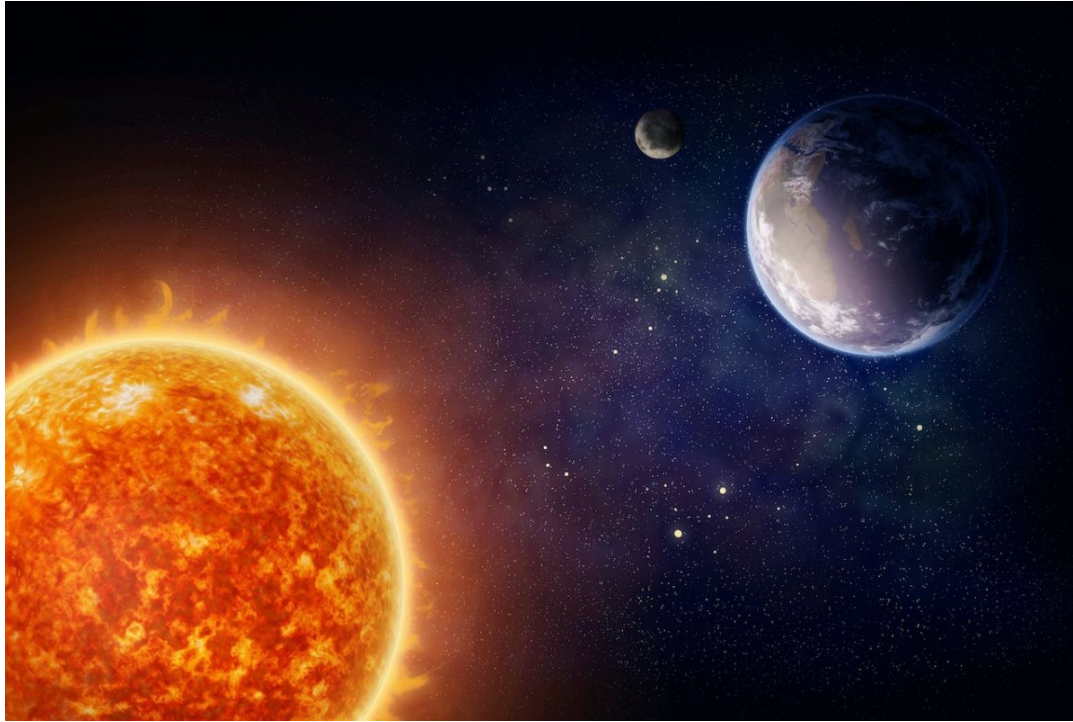
Biogeochemistry:

study the chemical links between biotic and abiotic realms of an environment

Periodic table of the elements

period	group 1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1	H																	He	
2	Li	Be											B	C	N	O	F	Ne	
3	Na	Mg											Al	Si	P	S	Cl	Ar	
4	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
5	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	
6	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	
7	Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og	
lanthanoid series 6			58	59	60	61	62	63	64	65	66	67	68	69	70	71			
			Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu			
actinoid series 7			90	91	92	93	94	95	96	97	98	99	100	101	102	103			
			Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr			

*Numbering system adopted by the International Union of Pure and Applied Chemistry (IUPAC).



We are in fact made of the same stuff as stars 😊

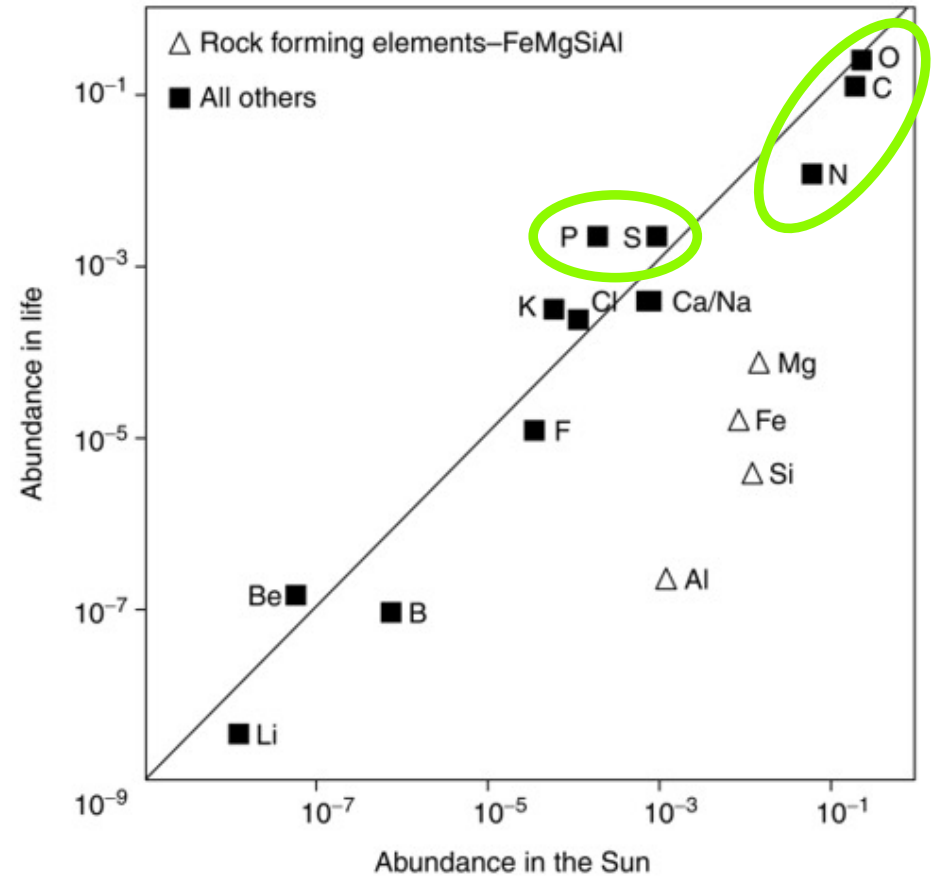


Figure 2.2. Relative abundance of elements in living tissue versus abundance in the Sun. Data from Langmuir and Broecker (2012) with data identified following Asplund et al. (2009). Graph from Schlesinger and Bernhardt, *Biogeochemistry* 4th ed., 2020.



Long-term Ecological Research (LTER) Program

From the International Biological Program (late 1960s-70s)
National Science Foundation
Ecosystem Studies 1970s
LTER program begins 1980

Goals of understanding linkages between material, energy, primary producers, consumers, at whole-system scales (watershed or lake)

Our research is borne from these ambitious efforts.

**A Sand County Almanac
and Sketches Here and There
by
Aldo Leopold**

**Oxford University Press
1949**

Odyssey

X had marked time in the limestone ledge since the Paleozoic seas covered the land. Time, to an atom locked in a rock, does not pass.

The break came when a bur-oak root nosed down a crack and began prying and sucking. In the flash of a century the rock decayed, and X was pulled out and up into the world of living things. He helped build a flower, which became an acorn, which fattened a deer, which fed an Indian, all in a single year.

From his berth in the Indian's bones, X joined again in chase and flight, feast and famine, hope and fear. He felt these things as changes in the little chemical pushes and pulls that tug timelessly at every atom. When the Indian took his leave of the prairie, X moldered briefly under-

[104]

ground, only to embark on a second trip through the bloodstream of the land.

This time it was a rootlet of bluestem that sucked him up and lodged him in a leaf that rode the green billows of the prairie June, sharing the common task of hoarding sunlight. To this leaf also fell an uncommon task: flicking shadows across a plover's eggs. The ecstatic plover, hovering overhead, poured praises on something perfect: perhaps the eggs, perhaps the shadows, or perhaps the haze of pink phlox that lay on the prairie.

When the departing plovers set wing for the Argentine, all the bluestems waved farewell with tall new tassels. When the first geese came out of the north and all the bluestems glowed wine-red, a forehanded deer mouse cut the leaf in which X lay, and buried it in an underground nest, as if to hide a bit of Indian summer from the thieving frosts. But a fox detained the mouse, molds and fungi took the nest apart, and X lay in the soil again, foot-loose and fancy-free.

Next he entered a tuft of side-oats grama, a buffalo, a buffalo chip, and again the soil. Next a spiderwort, a rabbit, and an owl. Thence a tuft of sporobolus.

All routines come to an end. This one ended with a prairie fire, which reduced the prairie plants to smoke, gas, and ashes. Phosphorus and potash atoms stayed in the ash, but the nitrogen atoms were gone with the wind. A spectator might, at this point, have predicted an early end of the biotic drama, for with fires exhausting the nitrogen, the soil might well have lost its plants and blown away.

But the prairie had two strings to its bow. Fires thinned its grasses, but they thickened its stand of leguminous herbs: prairie clover, bush clover, wild bean, vetch, lead-plant, trefoil, and Baptisia, each carrying its own bacteria housed

[105]



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Between each of his excursions through the biota, X lay in the soil and was carried by the rains, inch by inch, downhill. Living plants retarded the wash by impounding atoms; dead plants by locking them to their decayed tissues. Animals ate the plants and carried them briefly uphill or downhill, depending on whether they died or defecated higher or lower than they fed. No animal was aware that the altitude of his death was more important than his manner of dying. Thus a fox caught a gopher in a meadow, carrying X uphill to his bed on the brow of a ledge, where an eagle laid him low. The dying fox sensed the end of his chapter in foxdom, but not the new beginning in the odyssey of an atom.

Íⁿ'zhúje'waxóbe

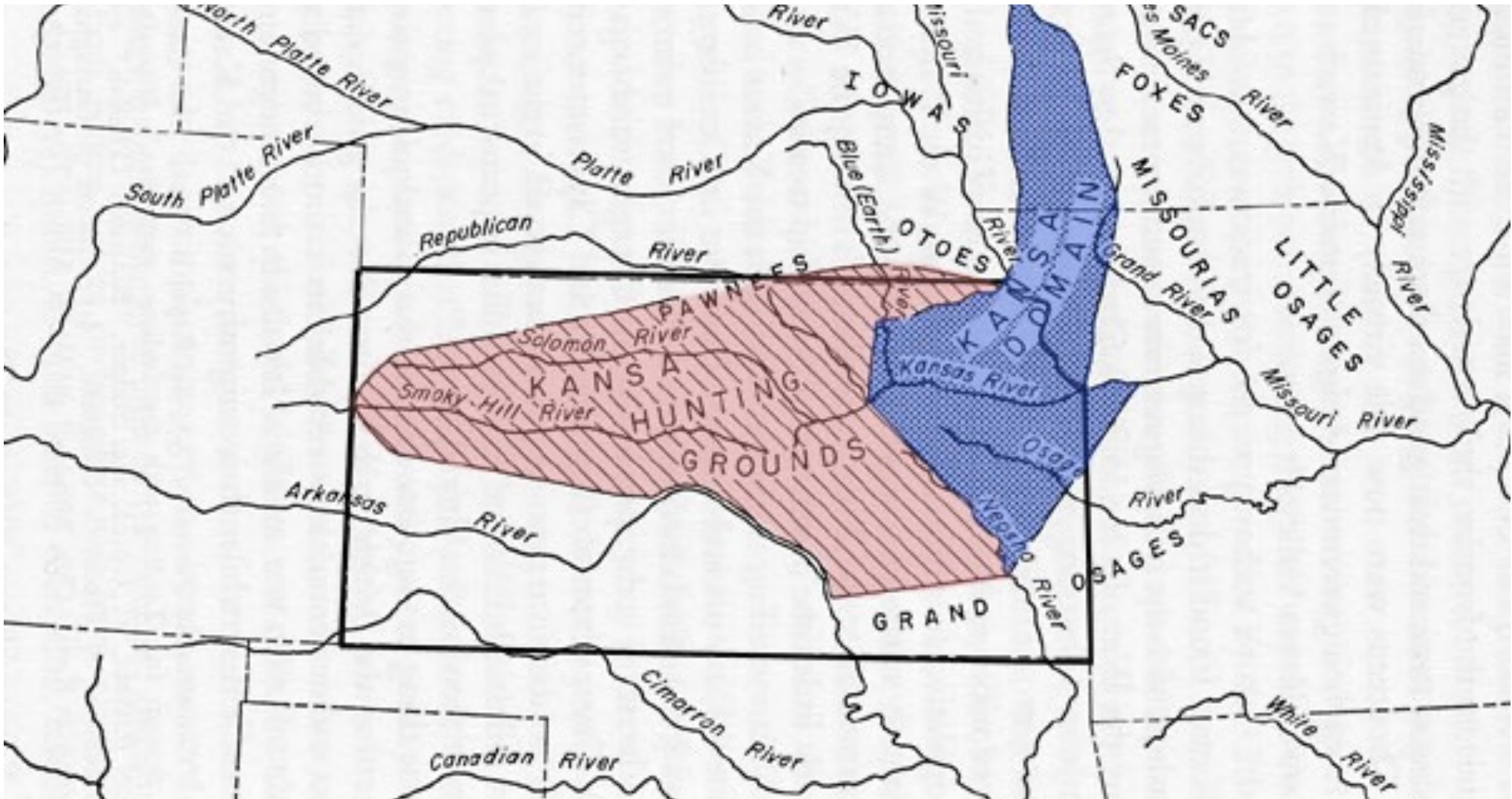
The Sacred Red Rock

<https://www.robinsonpark1929.com/curriculum>

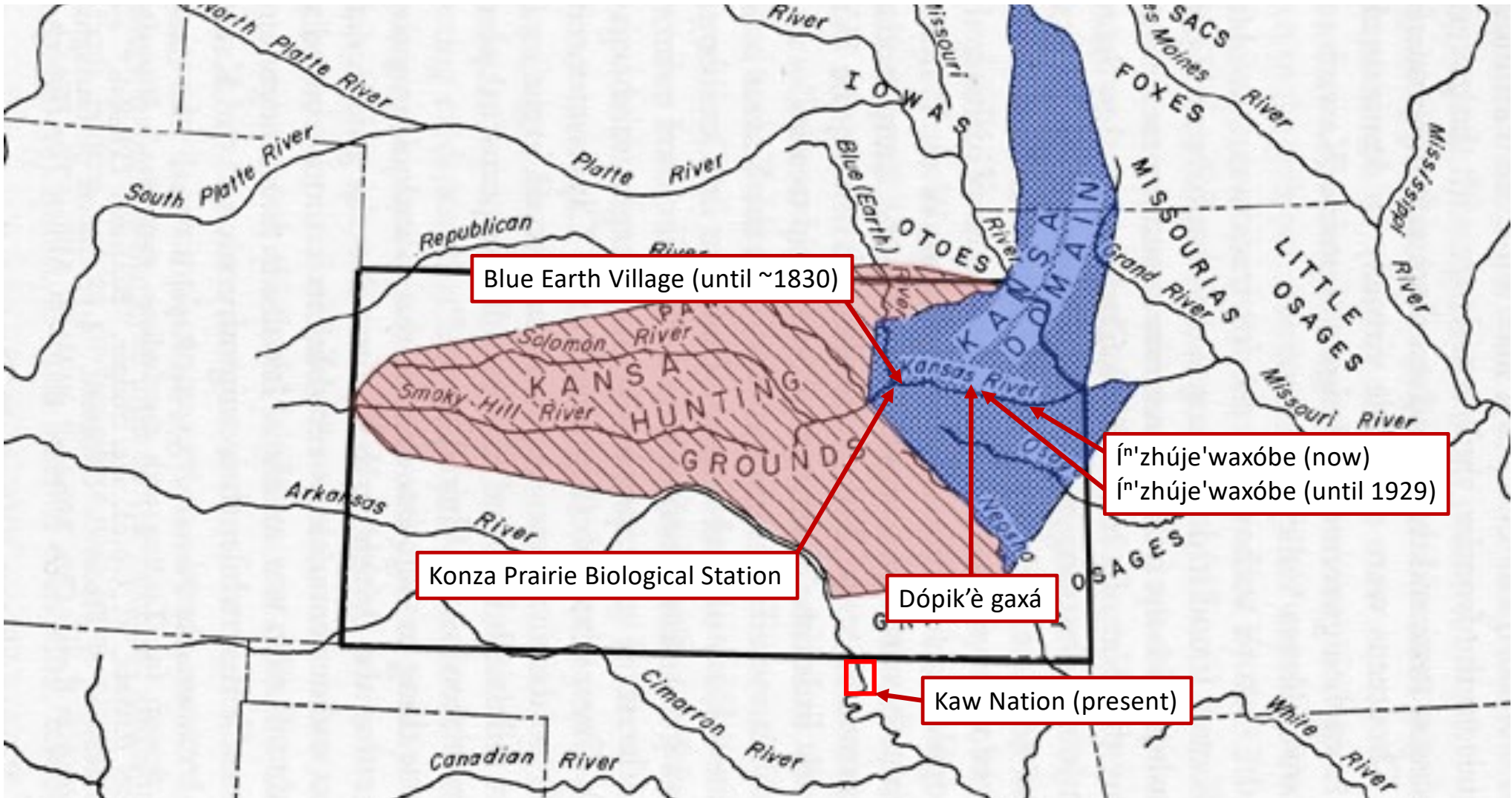


The background of the slide is a blurred photograph. It appears to show a person's face and hands, possibly in a traditional or cultural setting, but the details are out of focus. The colors are warm, with shades of beige, brown, and white.

Kanza Elder Curtis Kehkahbah
tells Íⁿ'zhúje'waxóbe's story to
Kanza youth (recorded March 9,
2021).



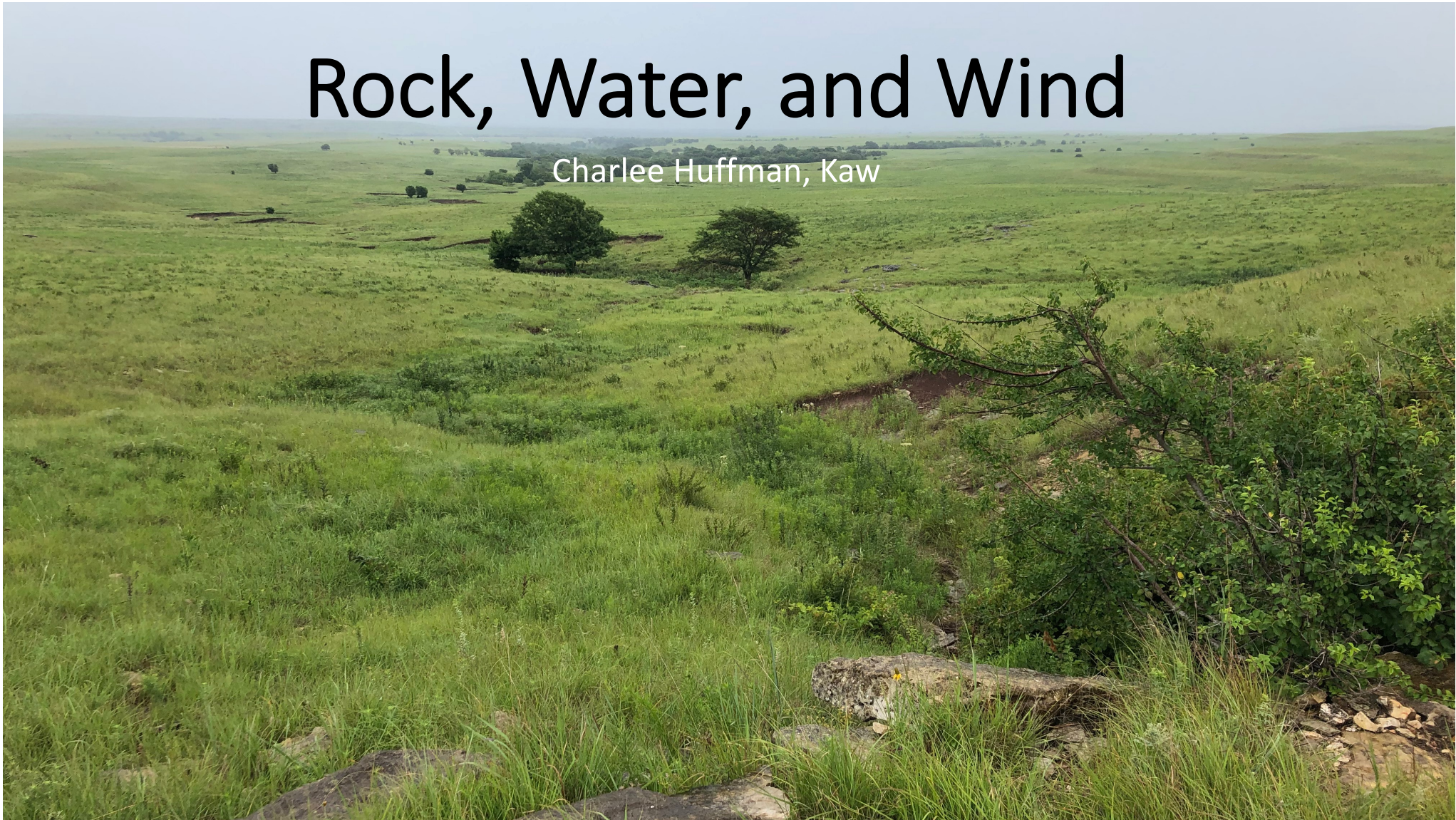
<https://www.kawmission.org/places/kawmission/lethalkanzareservations.htm>; <https://sites.google.com/site/kanzalanguageandlandscape/home?authuser=0>



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Charlee Huffman, Kaw





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