

STATION 3: KANAK, NIGER

Background Information

Watch the [video on Kanak, Niger](#).

Continuing along the eighth meridian, you enter the continent of Africa. A blast of hot air hits your face as you enter a vast expanse of sand. The dry heat of the desert night leaves your throat parched and aching for a sip of water. Ironically carved into the wall of the Kanak, Niger, room are the French words *Je suis une mer*. In English, that means “I am an ocean.”

To a geologist, large deposits of sand are a sign that sometime in the past, the desert was an ocean. Peepholes in the wall beckon you to take a 135-million-year climate journey, from the past to the present. Throughout geologic time, tectonic activity and slight changes in the Earth’s orientation to the sun have affected climate in the Saharan region of Africa. Scientists know from human remains, animal remains, and pollen that only 6,000 years ago, this region was lush with vegetation and water from consistent rainfall. However, that same type of evidence indicates an abrupt change in precipitation happened around 6,000 years ago. The change in climate may be attributable to natural changes in Earth’s orientation to the sun, [tectonic activity](#), changes in climate in Europe, and human agricultural activity. Like climate change detectives, scientists are asking questions, collecting evidence, and creating models to explain how the [Sahara](#) changed from warm and humid to hot and dry.

Niger is a landlocked country with 80 percent of the land over as desert. The coordinates for Kanak are 9° 2’ E, 15° 31’ N. At the time Werner and Goldberg visited Kanak, it was an oasis, a place where seasonal rainfall provided underground water and vegetation for nomadic tribes of goat herders. It should not be a surprise that the climate here is classified as Saharan.

You view a video interview of an elderly [Tuareg](#) woman (nomads in West-Central Africa). Her story, translated into English, tells a tale of climate change in one lifetime. She says, “Many things were different when I was a young girl. I saw things that I no longer see: giraffes, ostriches, different kinds of turtles, antelopes, and various deer species. Back then we had lots of water, and a river between the dunes. Sometimes it rained for an entire week, and afterwards lots of plants and trees would grow. Lots of plants! Not like now.” (*Klimahauss*)

In the current decade, Tuareg tribesmen dig wells to depths of 70 or more feet to find water in the desert. But temperatures are rising, and rainfall is decreasing in the Sahara, making Niger even hotter and drier. The desert boundary threatens to push westward and south into regions of Niger where rainfall is higher and vegetation is more plentiful.

Almost all of Niger’s population have settled into the southern regions along the Niger River. Human agricultural activity and deforestation as an economic activity are contributing to climate change in southern Niger. Wind erosion in areas cleared for agriculture increases the rate of desertification.

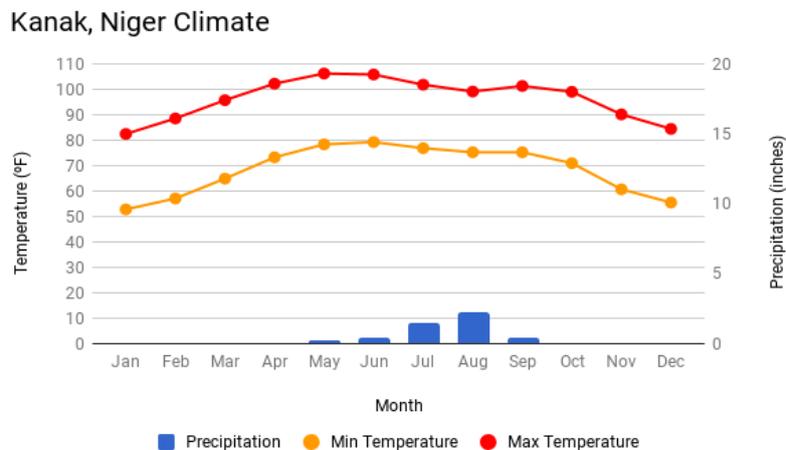
Sometimes the change in climate can be explained by overgrazing by goat herds, agricultural practices, and deforestation.

Leaders of African nations wondered: Could the desertification from climate change be mitigated by restoring vegetation? It is too soon to answer this question with a definite yes or no. However, early results of the African Forest Landscape Restoration Initiative are promising. Support for the African-led effort to restore 100 million hectares of African forests

([AFR100](#)) initially came from the German Ministry for Economic Cooperation and Development and World Resources Institute. The AFR100 project is managed by a partnership of African nations, engages local inhabitants in restoration, and has high potential to offset climate change impacts.

Explore Kanak

1. Use Google Earth to develop a sense of place.
2. Use the data and information on the climograph to observe patterns in rainfall and temperature.



3. Read "[How do You Stop the Desert? Niger May Have the Answer](#)" (Grosfield, 2018).
4. Identify factors that influence climate.
5. Identify sources of carbon dioxide and other greenhouse gas emissions.

Explore global temperature changes at [NASA Vital Signs Climate Time Machine](#).

Predict Climate Change	Climate Change Threat	Climate Change Impact
Warmer temperatures	Increased periods of drought	Loss of vegetation
Lower precipitation in desert regions	Desert expansion	Water shortages

Research

Research how vegetation may mitigate desertification. What role does vegetation play in soil retention and in rainfall?