# Waterhistory-Aguadas, Cenotes, and Chultuns

## BACKGROUND

In the lowlands of the Yucatan Peninsula and neighboring coastal regions where the Maya settled, much of the land is underlain with an extensive, porous limestone layer that contains a huge underground aquifer. The rains quickly percolate down to this aquifer. As a result, surface water is scarce despite heavy tropical precipitation. Few rivers or streams exist in this region.

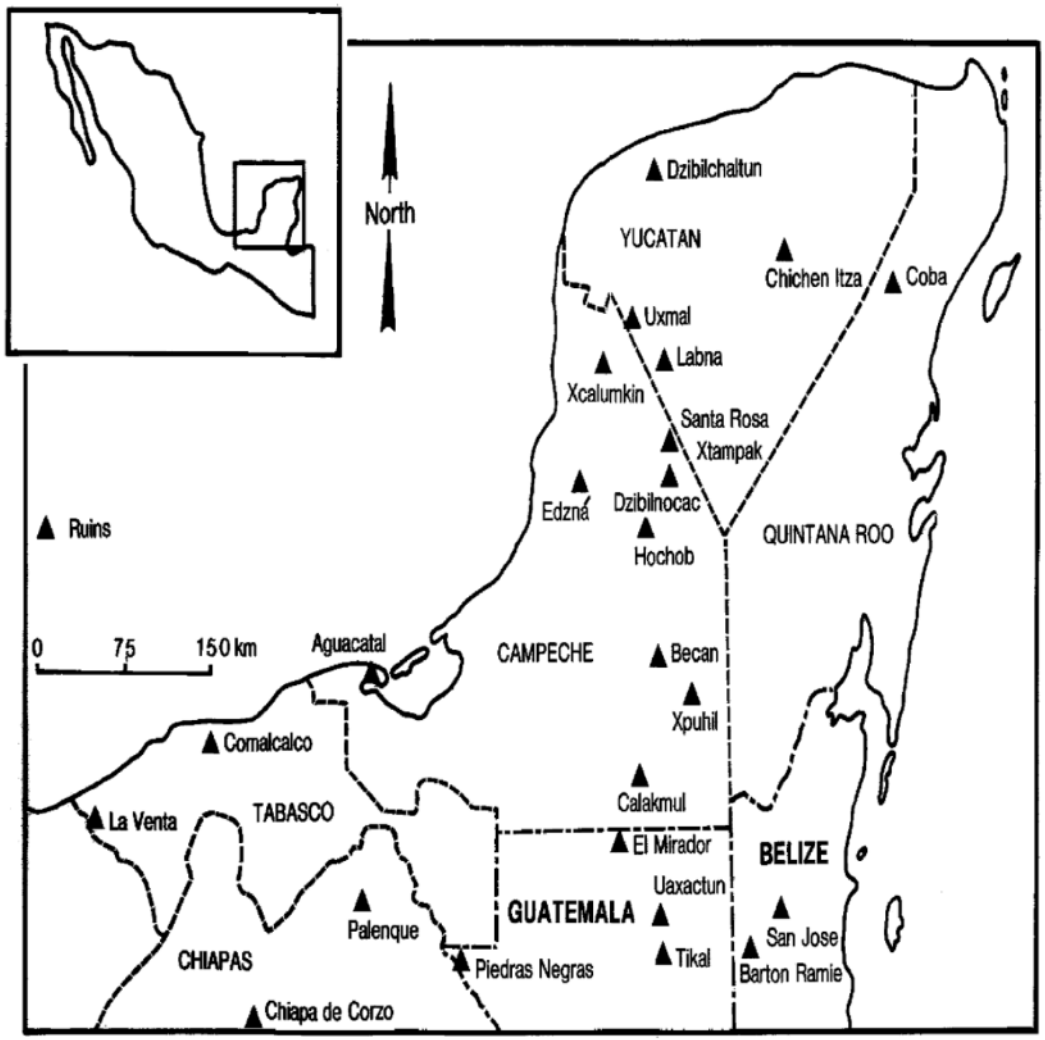
Yucatan Peninsula consists largely of coral-reef formations which emerged from the surrounding ocean 5 million years ago. As ocean levels dropped, groundwater trickled into the cracks in the porous limestone and, over the millennia, carved today's fragile network of underwater rivers, caves, and sinkholes.

## WATER SUPPLY TECHNOLOGIES

The Maya used several water supply technologies to accommodate this environment. An important source of water were underground caves called cenotes (se-NO-tes). In addition to water supply, cenotes had important religious significance. The Maya considered them portals to the underworld, the place they journeyed in their afterlife to meet gods and ancestors. Yucatan's Department of Ecology has identified and mapped over 2,200 cenotes. The Maya sometimes enlarged the cave entries to provide easier access.

There is a group of cenotes in Dzitnup, in central Yucatan's, an area of traditional corn farming. Visitors are often surprised that indigenous Maya are still around, and that cenotes are the principal reason. Ancient Mayans founded villages near cenotes, the main source of water, and often kept these sacred water holes secret from colonial powers.

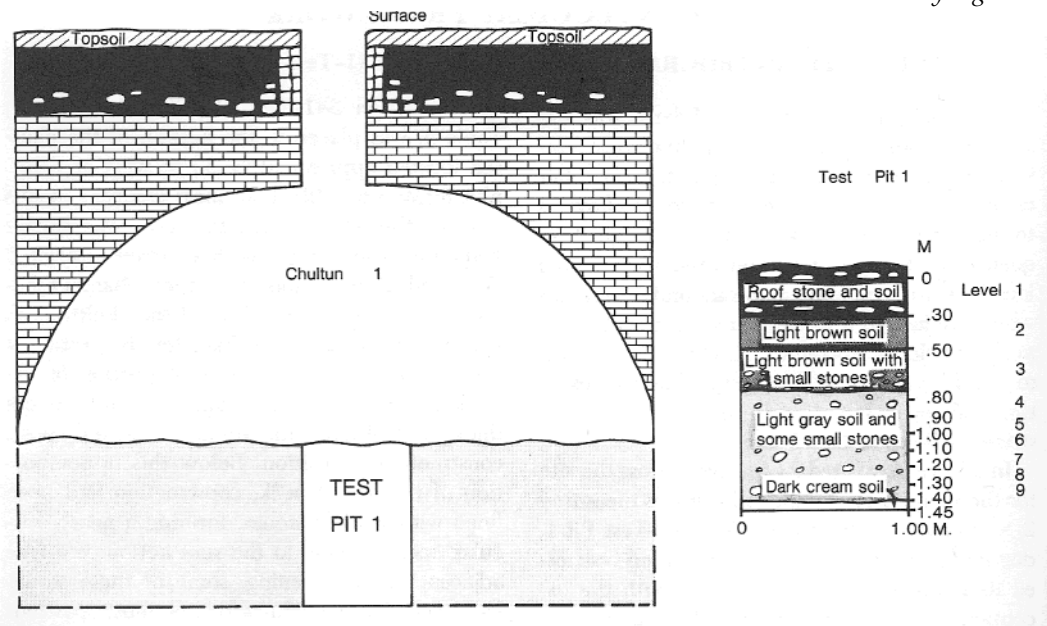
The Maya used natural surface depressions as water reservoirs, lining many to reduce seepage losses. They also took advantage of water that was collected in the depressions left when soil was removed for house construction (aguados). At Edzna (see illustration 1), there were 58 aguadas at house mound sites that would have been suitable for collecting and storing water.




*Map of Maya area showing various archaeological sites (from Matheny et. al.).*

Elsewhere the Maya constructed cisterns--call chultuns--in the limestone rock under buildings and ceremonial plazas. The Maya engineers devised drainage systems from buildings and courtyards to divert rain runoff into the chultuns to provide year-round water supplies in areas where cenotes did not exist, such as in northwestern Yucatan.

A chultun investigated at Edzna is fairly typical. It was bottle shaped in the cross section with a narrow restricted neck and a large globular-shaped chamber below (see illustration 2). The total depth of the Edzna chultun was slightly more than 5 meters.




*Profile of an excavated chultun at Edzna with test pit results (from Matheny et. al.).*

Chultuns were frequently lined with plaster to prevent seepage and averaged about 7,500 gallons each in capacity. This is enough to supply about 25 people year-round. Professor Sylvanus Morley, a noted researcher of Mayan civilization, reported that the total chultun capacity available to some of the Yucatan towns could support from 2,000 to 6,000 people.

The ancient Lowland Maya typically employed one or more of the above technologies for obtaining and storing water, depending on local soil and rock conditions (Matheny, 1983). At sites like Edzna, only 12 chultuns have been found. But chultuns were widely used at nearby sites, such as Dzibilinocac, Santa Rosa Xtampak, Labna, and Uxmal. At Santa Rosa Xtampak, for example huge chultuns have been found; the entire civic ceremonial area was served by chultuns. At Dzibilinocac both chultuns and wells were used, but wells were more important. At Edzna, aguadas and canals were the primary water supply.

## TRAVEL HINTS

Cenotes accessible to the public are found all around Yucatan and are best visited the first time with a guide. A number of cenotes are open for swimming, snorkeling, and scuba diving (recommended for experienced divers only). Note that these geologically delicate caves should be entered with great care. A good place to start is at Aktun Chen, just south of Akumal on the Caribbean coast, a 988-acre ecopark with three cenote caves, wildlife (monkeys, iguanas, wild boar), and rain forest flora.

## References

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