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HIDRAULICA DE AGUAS SUBTERRANEAS Y SU APROVECHAMIENTO

TEMA 4
SUBSIDENCIA DE SUELOS
OTOÑO 2010

UNIVERSIDAD DE CHILE
FACULTAD DE CIENCIAS FÍSICAS Y MATEMÁTICAS
DEPARTAMENTO DE INGENIERIA CIVIL

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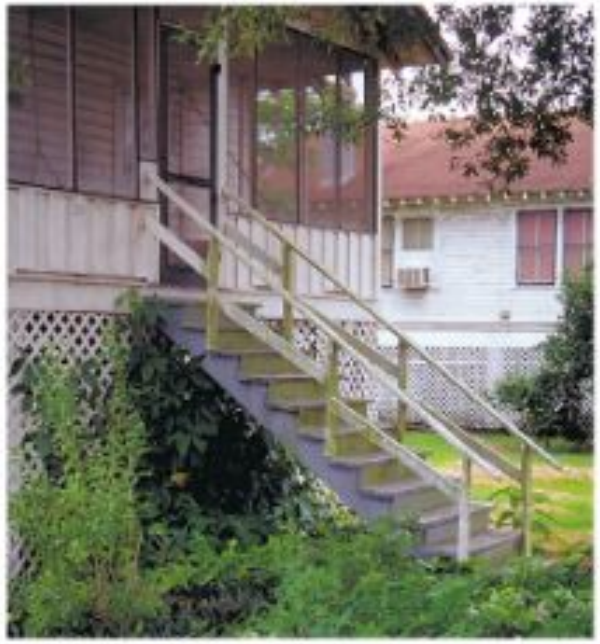


1925
1955
SAN JOAQUIN VALLEY
CALIFORNIA
BM 3661
SUBSIDENCE 9M
1925-1977
1977

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Tom Scott

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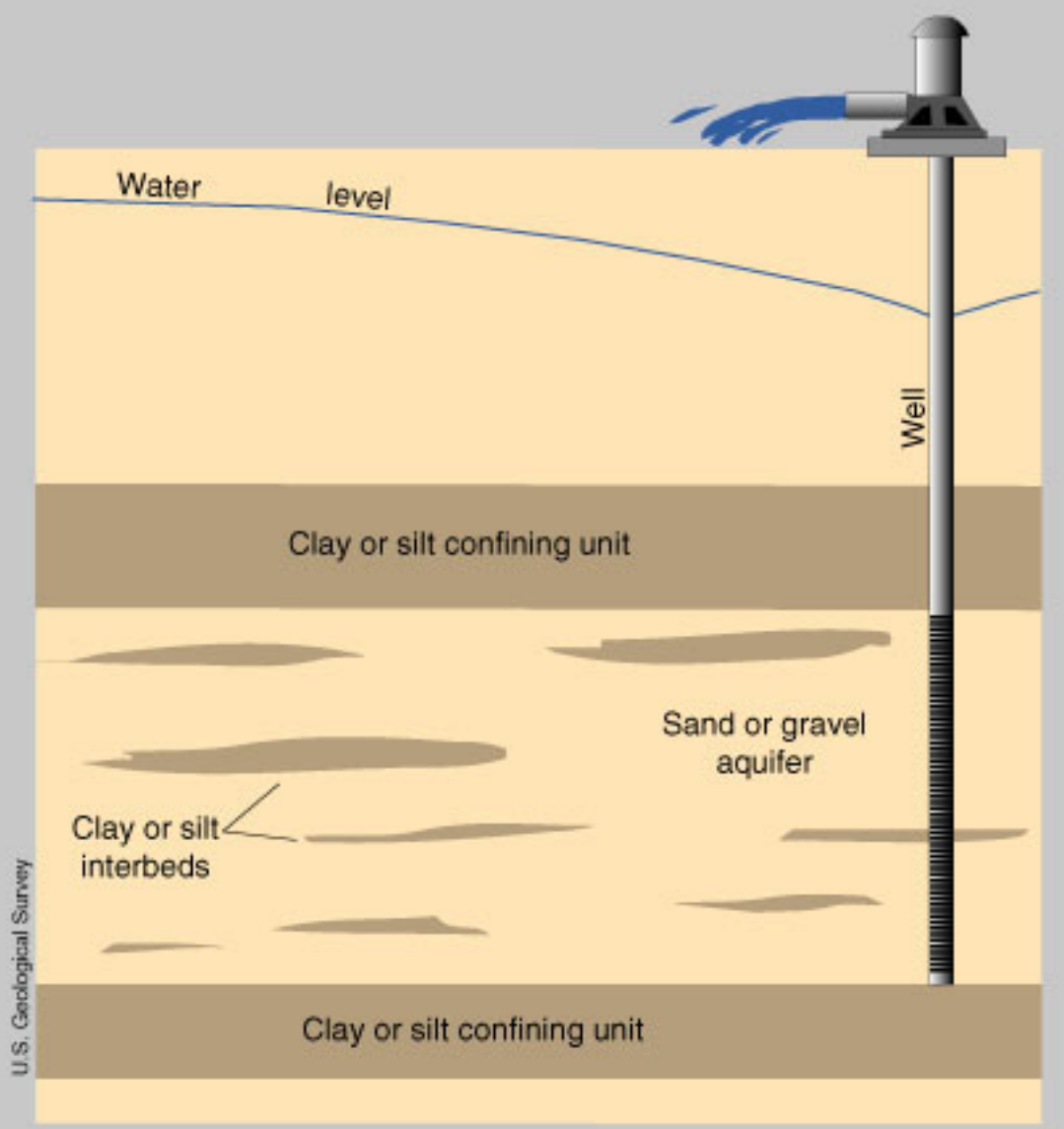

Figure 2. An aquifer system susceptible to compaction that results in land subsidence. Release of water from clay and silt confining units and interbeds causes a reduction in thickness of these compressible sediments.

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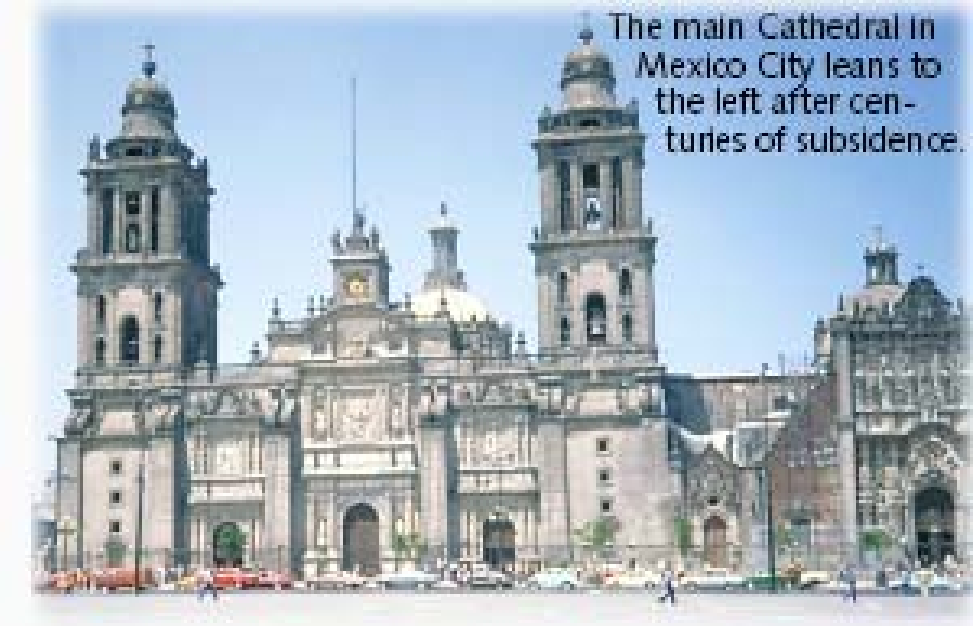

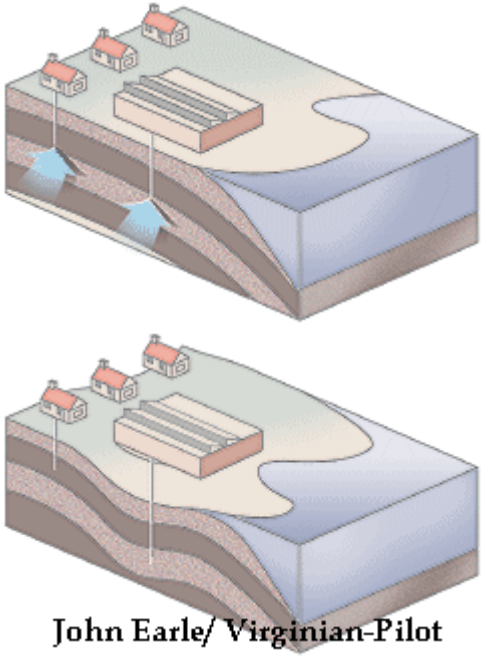

John Earle/ Virginian-Pilot

Sign warning motorists of subsidence hazard in Pima County, Arizona, USA, 1981.
Credit: S.R. Anderson, USGS

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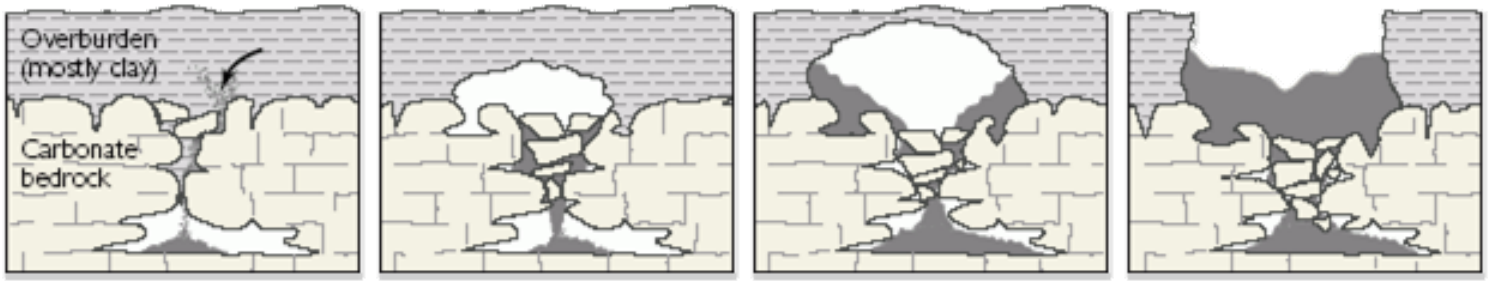
Sediments spall into a cavity.

As spalling continues, the cohesive covering sediments form a structural arch.

The cavity migrates upward by progressive roof collapse.

The cavity eventually breaches the ground surface, creating sudden and dramatic sinkholes.



Granular sediments spall into secondary openings in the underlying carbonate rocks.

A column of overlying sediments settles into the vacated spaces (a process termed "piping").

Dissolution and infilling continue, forming a noticable depression in the land surface.

The slow downward erosion eventually forms small surface depressions 1 inch to several feet in depth and diameter.

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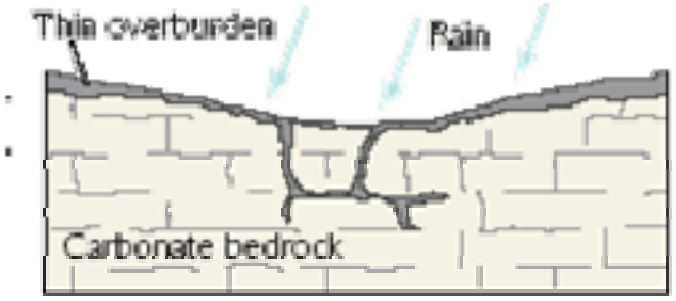

Rainfall and surface water percolate through joints in the limestone. Dissolved carbonate rock is carried away from the surface and a small depression gradually forms.

On exposed carbonate surfaces, a depression may focus surface drainage, accelerating the dissolution process. Debris carried into the developing sinkhole may plug the outflow, ponding water and creating wetlands.