

Sink Holes

THE MOST OBVIOUS KARST FEATURES ON CAMPUS ARE SINKHOLES, which are simply closed depressions or hollows. Good examples of sinkholes occur in the center of the horseshoe-shaped parking lot at the Cowell Health Center, near the main stairwell of the Baskin Engineering building (Figure 2-1, location 6), and about 200 m (650 feet) northwest of Family Student Housing in the southwestern part of the campus (Figure 2-21). Most sinkholes on campus are roughly circular and range in size from tiny depressions a meter or two deep and a few meters across (such as one near the southeast corner of the Communications building) to huge bowls that are tens to hundreds of meters across and many meters deep (such as the one just across Empire Grade from the west entrance to the campus). Most of the sinkholes are partially filled by sediment that was washed into the holes by running water or that slumped and fell into the holes from the steep sides.

The sinkholes on campus may have formed in a number of different ways, as shown in Figure 2-23. Perhaps the most common way is by the collapse of the roof of a cave (diagrams A and B). Other sinkholes on campus may have formed not by roof collapse but by simple dissolution (diagram C). As the joints and fractures in the marble are enlarged by dissolution, the overlying ground surface settles to form a closed depression. A third possibility is that as the joints and fractures in the marble were widened by dissolution, and the overlying soils and Quaternary deposits slumped into the openings (diagram D).

In some places on campus, two or more sinkholes have grown together to form a much larger depression. A good example of such a composite feature is the large bowl just northwest of the Farm. The sinkholes that form the bowl are arranged in a line; some geologists believe that this line of sinkholes formed along a buried east-west trending fault zone. Other sinkholes — known as swallow-holes — occur in streambeds; the stream water flows into the swallow-hole and disappears underground. A good example of a swallow-hole can be seen just west of the Thimann Laboratories in the bottom of the small, unnamed canyon between the labs and Heller Drive (Roller 1980). Another swallow-hole is located in the canyon just northeast of Porter College.

Caves

A NUMBER OF CAVES — SOMEWHERE BETWEEN a half-dozen and a dozen, depending on whom you ask — have been found in the UCSC area. Most of these occur in Cave Gulch, along the western boundary of the campus. The locations of the caves are a poorly kept secret; however, the easiest and safest way to explore them is to enlist the aid of a knowledgeable and experienced person. Some of the caves have been mapped and described in detail by W. R. Halliday (1956, 1962), by Bruce Rogers (1983), and by John Tinsley (1985).

Several of the caves in Cave Gulch have been developed by dissolution of the marble along joints and faults, resulting in nearly linear passageways. Most geologists believe that the caves were formed by dissolution that occurred at or below the water table, where cracks, pores, and all spaces within the rock are completely filled with water and where there are no air spaces. The caves are now dry for much

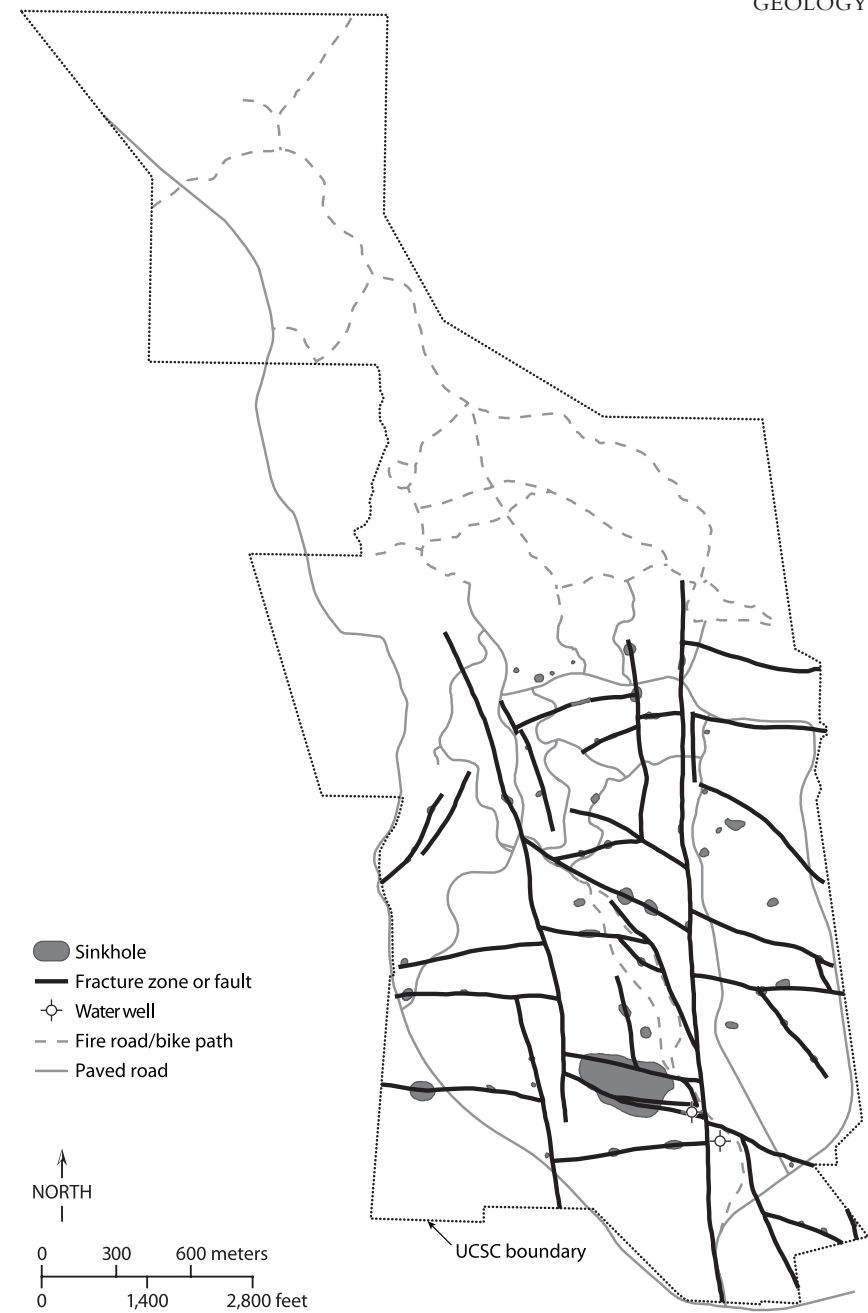


Figure 2-21: Map showing sinkholes, major faults, and fracture zones that influence the underground flow of water, and water wells near the Farm, compiled from published sources (Nolan, Zinn, and Associates 2005, Rogers E. Johnson and Associates 1987, Roller 1980, UCSC Campus Facilities Office 1978) and unpublished field observations by the authors.