USGS
science for a changing world

U.S. GEOLOGICAL SURVEY MENLO PARK CAMPUS

Self-Guided Tour

Welcome to the USGS

The U.S. Geological Survey (USGS), established by an act of Congress in 1879, is the Nation's largest natural science and civilian mapping agency. The USGS works in cooperation with more than 2,000 organizations across the country to provide reliable, impartial scientific information. This information is used to minimize the loss of life and property from natural disasters, safeguard the Nation's natural resources, and enhance quality of life through careful monitoring of water, biological, energy, and mineral resources.

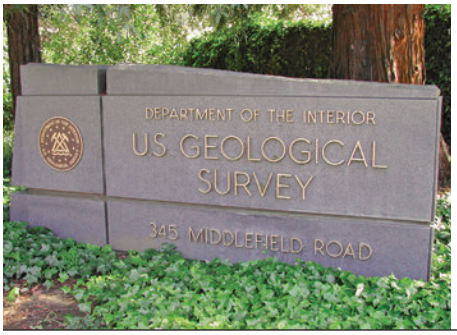
Natural and Historical Setting

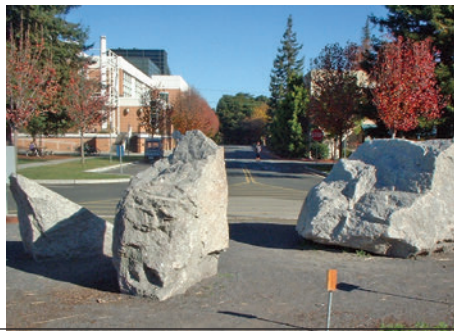
The Menlo Park campus of the U.S. Geological Survey (USGS) is sited in the San Francisco Bay region, an area of complex and exciting geology. This region occupies the boundary zone between two of the major tectonic plates that make up the outer shell of the Earth—the Pacific Plate and the North American Plate. The many active faults slicing through the region, the frequent earthquakes, and the very young ranges of hills and mountains that have been pushed up are results of the relentless motion of these plates.

San Francisco Bay occupies a depression formed when a block of the Earth's crust subsided between two of the region's major faults. The rise of sea level about 10,000 years ago (at the end of the Pleistocene Epoch of Earth history) flooded this depression to form the Bay, an inlet of the Pacific Ocean.

The USGS Menlo Park campus was built on sedimentary deposits—mostly sands, gravels, and silts—laid down during the past few thousand years on the margins of the bay by San Francisquito Creek and other streams carrying debris down from the nearby hills. These deposits continue to form today, and new layers are added to the land whenever the streams flood.

This area, like much of the lands around San Francisco Bay, was once home to the Ohlone people. In the late 1700s the Spanish explored the area and established several large rancheros. The Gold Rush brought many new settlers, who discovered the mild and sunny climate in the 1850s, and soon many wealthy families from San Francisco acquired Menlo Park properties as summer homes. The site of the Menlo Park campus was once part of the estate of Mark Hopkins, of California railroad and hotel fame. During World War II, the site was part of the Dibble Army Hospital, the receiving area for wounded returning from the Pacific front. After the hospital was decommissioned in 1947, part of its site was designated by Congress for use by the USGS.





U.S. Department of the Interior
U.S. Geological Survey

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Self-Guided Tour

This self-guided tour provides an introduction to the grounds and some of the buildings of the USGS Menlo Park campus. Exhibits in the second-floor hall of Building 3 and in the USGS library at the corner of Building 15 are open for viewing weekdays between 8:30 a.m. and 4 p.m. Please do not enter buildings that are not designated as part of the tour. Restrooms are available in Building 20 near the cafe. This tour should take approximately one hour to complete.

Stop 1: Building 3—As you enter the lobby of Building 3, you'll see the USGS Press Room on the right, where scientists are interviewed about breaking science research. Proceed to the second floor by using the elevator that is just past the lobby and in the center of the building, or by turning right and walking down the long hallway to the stairs. The atrium at the top of the stairs contains changing exhibits and leads to the auditorium where public lectures are held. A century-old plaster raised-relief map of California near the stairs was originally hand-crafted by a USGS cartographer in 1892 and was restored by the Bureau of Land Management in 1945.

Stop 2: MaPS (Map and Publication Sales)—From the top of the stairs (or from the elevator), follow signs to Map and Publication Sales (MaPS). MaPS is operated by the California Geological Survey (CGS) and offers an opportunity to browse through topographic and geologic maps, books, and other publications from both the USGS and the CGS and to purchase items of interest. Numerous free brochures on earth science subjects are also available.

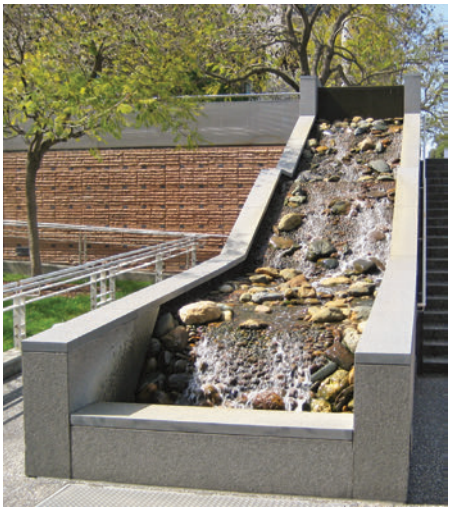
Stop 3: Building 15 Plaza—Return to the first floor of Building 3 and exit through the door at the end facing Middlefield Road. As you exit Building 3, under the stairwell on your left is a large specimen of gold-bearing sedimentary rock consisting of layers of hydrothermally deposited opal, chalcedony, and quartz from the McLaughlin Mine near Calistoga, California.

The outdoor plaza between Buildings 3 and 15 is shaded by graceful Jacaranda trees *(Jacaranda mimosifolia)*, native to Brazil. Their branches are full of beautiful lavender blossoms in June and July.

Turn left and proceed to the large black columns in the center of the plaza. The columns are an artist's conception of California, broken by faults. The black rock that makes up these columns, from the Academy Quarry in the western Sierra Nevada, east of Fresno, California, is approximately 120 million years old. It is a quartz diorite containing the dark-colored minerals hypersthene, hornblende, and biotite.

Stop 4: Fossil-bearing marine sandstone—Across the drive and beside the bicycle shed is a fossil-bearing marine sandstone of Paleocene age collected three miles north of Fairfield, California. The elongate spiral gastropods *(Turritella)* lived

in shallow water about 60 million years ago and were possibly killed and washed together by storm currents. The sediment and shells then slumped into deeper water before being hardened into solid rock.



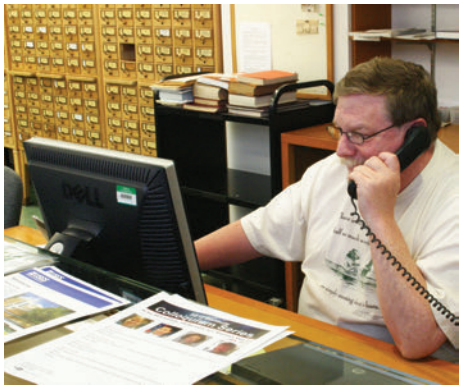
Stop 5: Waterfall and Building 15—Return to the black columns and proceed to the nearby quartz diorite water wall, which feeds an artificial stream that cascades down to the lower plaza. The riverbed waterfall, canal bench, and vortex whirlpool were designed by Douglas Hollis and are collectively titled Water Songs.

Follow the stairs down to the lower courtyard to view the waterfall. The waterfall is sometimes shut off to conserve water. If you cannot manage the steps, there is a ramp at the other end of the plaza.

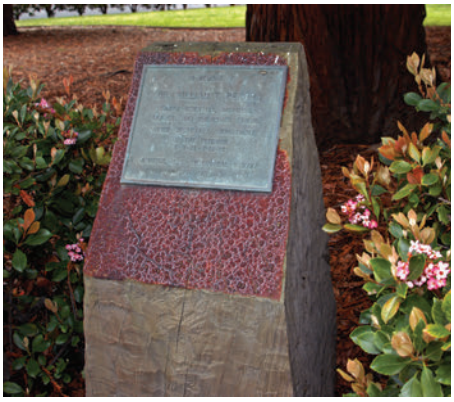
From the lower courtyard, a display of pillow lava is visible inside the glassed stairwell of Building 15. Pillow lava is produced when hot, fluid basaltic lava erupts under water. These pillows were dredged from depths of about 7,000 feet (2,100 meters) during USGS expeditions to the Juan de Fuca Ridge, 300 miles (480 kilometers) west of the Washington State coast.

Return to the upper plaza using the ramp to the left of the waterfall, turn left, and proceed to the corner of Building 15 (the Vincent E. McKelvey Federal Building), the largest building on the Menlo Park campus. McKelvey was the ninth director of the USGS (1971–1978) and did much of his early field work in the Sierra Nevada. The bottom floor of this 3-story, 96,000-square-foot (8,900 square meters) building was built 8–10 feet (2.5–3 meters) below ground level so that the building height would better match the residential neighborhood.

A wide range of research activities are housed in the building, from classical geochemistry to microbial ecology. Its 85 highly individualized laboratories include a clean room with solid polypropylene walls and cabinets and constant-temperature laboratories with epoxy-coated stainless-steel walls.



Stop 6: Library—At the top of the corner stairs is the library (a ramp is located to your left). The USGS library system contains the most extensive collection of natural science materials in the world. Here on the Menlo Park campus is a collection of 400,000 volumes and 350,000 maps, with an emphasis on the Western United States. The general public may use this library for research and reference (Monday – Friday, 8:30 a.m. – 4:30 p.m.), but materials may only be borrowed using interlibrary loan through a participating library. Inside the library you will find displays of rocks, minerals, and fossils from the San Francisco Bay area and elsewhere throughout the country.

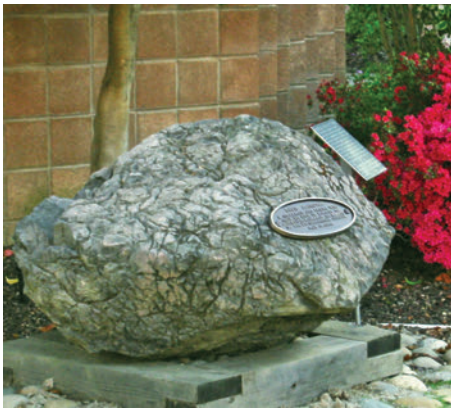


Stop 7: Pecora plaque—Leaving the library, cross the street to the two large Coast Redwood trees (*Sequoia sempervirens*). Beneath them is a bronze plaque on a redwood base honoring the memory of William Pecora, USGS Director from 1965 to 1971.

As you continue toward Building 1, you will pass Building 20 on your left. This is the USGS services building, which also houses a cafe that is open to the public from 6 a.m. to 4 p.m., Monday through Friday.

Stop 8: Petrified log—By the entrance to Building 1, you will notice a fossil log from Nevada that preserves the features of a tree from the Miocene Epoch of geologic time (from about 24 to 5 million years ago). The tree's wood has been replaced with silica (quartz).

Stop 9: Antarctica rock—Continue along the azalea-lined sidewalk parallel to Building 1 until you reach the second door and look left, toward the cafe. In a flowerbed adjacent to the sidewalk is a rounded granitic boulder. USGS scientists brought it back from Antarctica in 1984. It comes from the eastern flank of Iselin Bank, a large undersea ridge that extends nearly 124 miles (200 km) from the Ross Sea into the South Pacific Ocean. This is one of the largest pieces of Antarctica to have been shipped from that continent.



Stop 10: Mt. St. Helens lava—A few steps farther toward the cafe is another unusual rock. This piece of Mount St. Helens lava is dedicated to the memory of David Johnston, the USGS scientist who died in the catastrophic explosion of the mountain on May 18, 1980. This rock is an example of "breadcrust" lava from the deposit of an andesitic pyroclastic flow (high-speed flow of hot ash, gas, and rocks). Tree-ring dating techniques bracket the age of that deposit to between the years 1489 and 1556.

Stop 11: Blueschist—Retrace your steps to the Antarctica rock and continue left to the corner of Building 1, then turn right and continue walking until you are almost to the courtyard of Building 2. On your right is a large specimen of metamorphic blueschist collected in Marin County, north of San Francisco. Minerals in this rock (including small garnets) and its folded structure are evidence of immense pressure when it was formed deep in the Earth about 160 million years ago. A polished slice of the same rock at its base shows the highly folded structure. Its name reflects the abundance of a blueish mineral called glaucophane. The glittery look of the rock is from muscovite mica.

To the right of the blueschist is a most unusual tree, the Dawn Redwood (*Metasequoia glyptostroboides*). This species of tree was believed to be long extinct by western scientists until a small grove was discovered in China in 1946. Since that time, numerous seedlings have been propagated and planted throughout the world. Unlike the two California redwoods, this deciduous tree drops its needles each autumn.

To the left of the blueschist is a Giant Sequoia (*Sequoiadendron gigantea*) or mountain redwood. It is planted in soil, brought here from its native environment in the Sierra Nevada, that was derived from glacial debris. Such soil is crucial to the growth and health of Giant Sequoias.

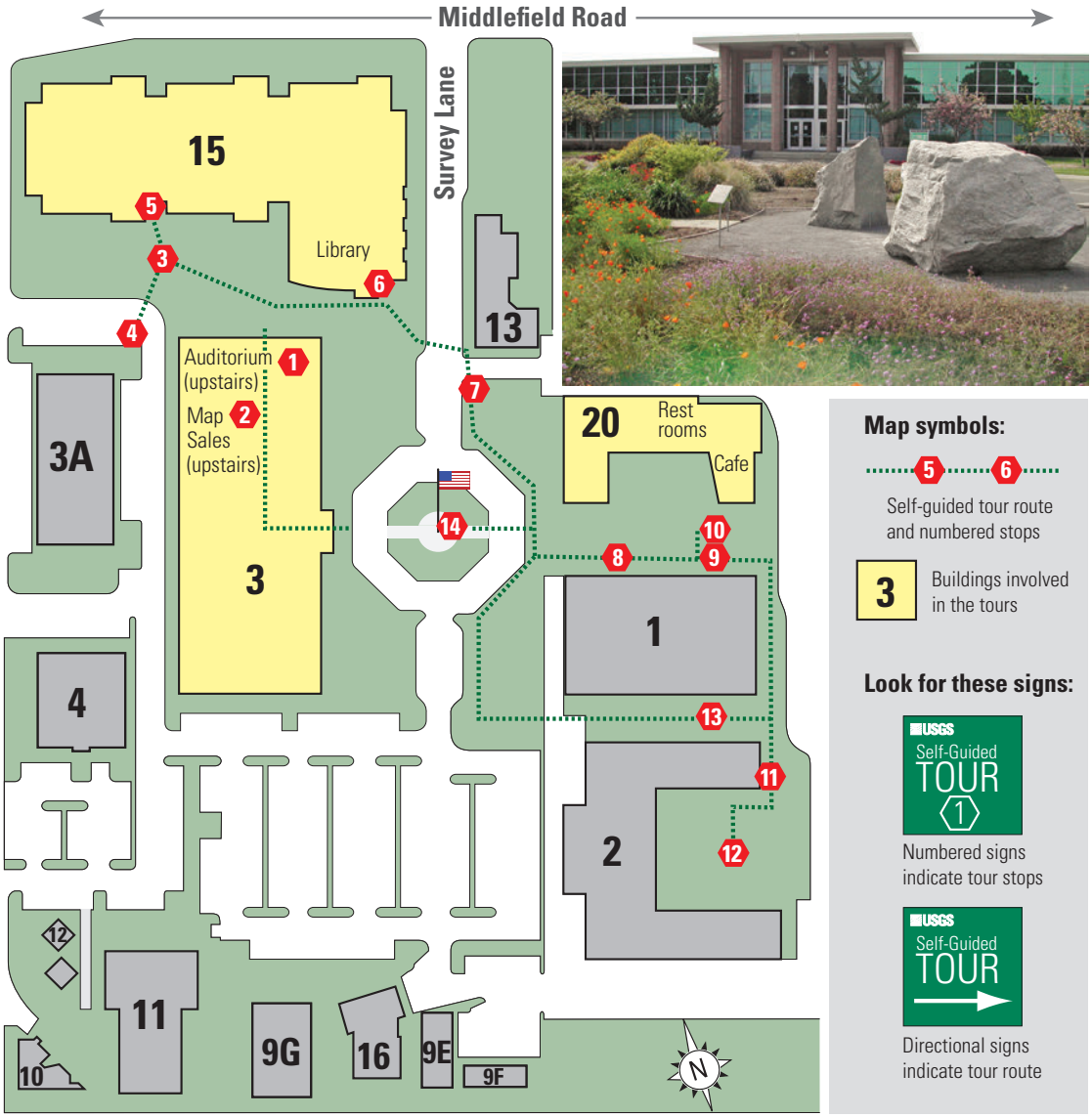
Stop 12: Building 2 courtyard—Continue into the courtyard of Building 2 and enjoy the numerous varieties of rhododendrons and azaleas that grace the courtyard. The USGS campus has the second-largest collection of rhododendron varieties in California. A Ginkgo tree (*Ginkgo biloba*), another ancient species native to China, with the fan-shaped leaves is located in the center planter. Under the Ginkgo is a small plaque to Roland Brown, a USGS paleobotanist of the last century who studied fossilized plants.

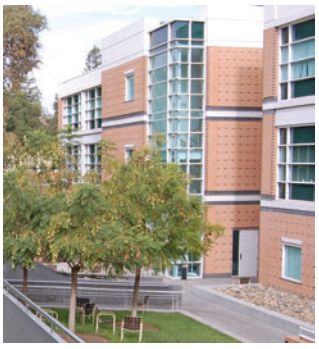
Stop 13: Arbor—Retrace your steps to the walkway between Buildings 1 and 2. In the summer months, the arbor between Buildings 1 and 2 is heavy with wisteria blossoms (*Wisteria frutescens*) and filled with the fragrance of star jasmine (*Trachelospermum jasminoides*). A large boulder at the entrance to the arbor is orbicular diorite from the Sierra Nevada in which the rounded "orbs" crystallized before the surrounding rock solidified. Although geologists understand how molten magma crystallizes into solid rock, this particular type of rock presents many mysteries as to exactly how it formed.

In late April and early May, the orbicular diorite is framed by the red and white blossoms of the surrounding rare rhododendrons, "Mi Amor" and "Beauty of Littleworth," as well as a rare deciduous tree, a Veitch

U.S. Geological Survey

Menlo Park Campus, 345 Middlefield Road, Menlo Park, California





Magnolia (*Magnolia* X. *veitchii* 'Peter Veitch'), to the left of the diorite.

To the left of the orbicular diorite is a plaque commemorating Howard Oliver, a USGS geophysicist and landscape hobbyist who was instrumental in selecting and planting many of the special azaleas, rhododendrons, camellias, and trees growing throughout the campus.

At the end of the wisteria arbor between the buildings is a large, upright slab of polished New Hampshire granite containing a large pegmatite vein. The gray mineral is quartz, the black mineral is biotite mica, and the white and pink crystals are different feldspars. The slab was a gift from Stanford University. Continue the tour by walking either left or right behind the granite slab to the courtyard between Buildings 1 and 2.

Notice the steel bracings on Buildings 1 and 2. These were added in 1979 as structural reinforcement to reduce the effects of ground shaking during an earthquake. They proved their worth during the 1989 Loma Prieta earthquake, when neither building suffered any serious damage. A small specimen of gold-bearing ore from Nevada can be seen next to Building 2.

Stop 14: Flagpole circle— Proceed through the courtyard between Buildings 1 and 2 and walk toward the main flagpole, which is surrounded by a circular garden of drought-tolerant plants.

To the right of the flagpole, at the end of the short sidewalk, is a USGS benchmark, "WMC 1994," that can be used to check your hand-held Global Positioning System (GPS) receiver. A handout with the benchmark coordinates with respect to various datums is available in MaPS.

Just beyond the benchmark are three granite boulders, donated by the USDA Forest Service, from Sonora Pass in the Sierra Nevada. The rocks solidified from magma (molten rock) that was intruded into the overlying rocks deep within the Earth about 86 million years ago, during the Cretaceous Period. The largest boulder weighs nine tons, and all three specimens contain unusually large phenocrysts (crystals) of orthoclase feldspar as much as four inches long.

We hope you enjoyed your visit to the USGS Menlo Park campus
To learn more about the USGS, visit
http://www.usgs.gov.

For more information about the Menlo Park campus, call 650-329-4390.
Information about our public lecture series is at
http://online.wr.usgs.gov/calendar
or call 650-329-5000.

This Fact Sheet and any updates to it are available online at
http://pubs.usgs.gov/fs/2007/3072/